TECHNOLOGY DEPARTMENT

JULY 1, 1959
Price 50c

TELEPHONE ENGINEER & MANAGEMENT

the telephone industry magazine

TELEPHONE ENGINEER & MANAGEMENT 50th ANNIVERSARY 1909 1959

PUBLIC LIBRARY
JUL 8 - 1959
DETROIT

STEPS THAT LEAD TO SALES, by Allan R. Stacey

The "Fletcher-Munson" Effect, by C. D. Ehinger

"SPUD" AIDS TELEPHONE TRAINING, by John S. Reed

Inventory Management Methods, by G. M. Jones

Directories show more profit

when our "Revenue Men" take over

OUR DIRECTORY "Revenue Men"—working from 32 strategically located sales offices—providing the Independent Telephone Industry with a flexible and highly skilled telephone directory organization, are equipped to render a Complete and Quality Directory Service.

These specialists, through the use of up-to-the-minute knowledge of the market—proper sales training—imagination—ideas—leadership—and hard work, produce results which more than measure up to accepted directory revenue standards.

Yes, the "Yellow Pages" revenues in the more than 800 directories we now produce for large and small Independent Telephone Companies prove the statement: "DIRECTORIES SHOW MORE PROFIT WHEN OUR 'REVENUE MEN' TAKE OVER."

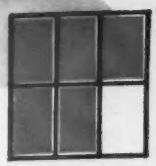
Write or phone our office nearest you for our Complete Directory Service Plan.

GENERAL TELEPHONE DIRECTORY COMPANY

1800 Oakton Street • DES PLAINES, ILLINOIS • VAnderbilt 4-2164

Divisional Sales Offices:

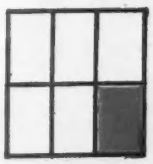
BLOOMINGTON, Ill. • 410 N. Prairie St. • Tel.: 3-8095
COLUMBIA, Mo. • 811 Cherry Street • GIbson 2-6907
DURHAM, N. C. • 108 E. Parrish Street • Tel.: 5133
ERIE, Penna. • G. Daniel Baldwin Building • Tel.: 2-4187
FORT WAYNE 2, Ind. • 229 E. Berry Street • Eastbrook 3477
HONOLULU 14, Hawaii • 1236 Waimanu St. • Tel.: 504-231
LEXINGTON, Kentucky • 157 Walnut Street • Tel.: 4-7626
LONG BEACH 15, Calif. • 1775 Ximeno Ave. • GEneva 3-7441
MADISON 3, Wisconsin • 214 N. Hamilton St. • ALpine 7-1667
MANILA, Philippine Islands • P. O. Box 673
SAN ANGELO, Texas • 110 South Taylor St. • Tel.: 6738
SPOKANE, Wash. • South 11 Monroe • MAdison 4-4336



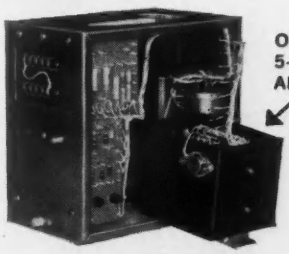
FIVE IDENTICAL PLUG-IN GENERATOR UNITS

Five interchangeable frequency generators—each complete with voltage regulator, oscillator, transformers, amplifiers, cut-off circuit. Each individually adjustable for both frequency and voltage. Frequencies stabilized against changes in input voltage, temperature, load.

Transistor circuits for long trouble-free life. No moving parts. No routine maintenance. Operates from 50-volt battery at extremely low drain.

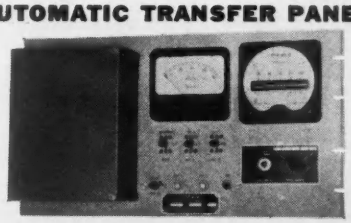


COMMON EQUIPMENT UNIT



Contains, for all frequencies: ample battery filter, remote control relay, audible ringing tone generator with (optional) 5-watt tone amplifier.

AUTOMATIC TRANSFER PANEL

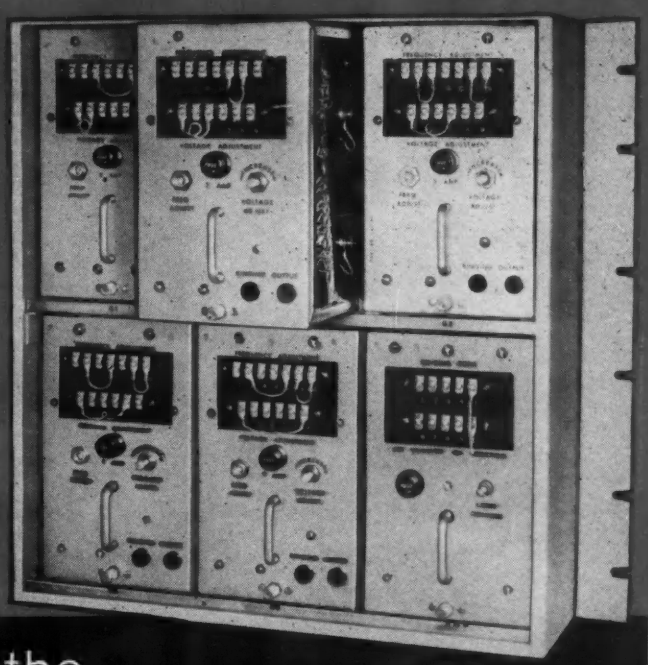


Connects two ringing machines together with either as the main machine, the other as standby. Load is automatically transferred to the standby and alarm is operated on partial or complete failure of the main. Manual transfer possible to check the standby. Either machine supplies load while other is metered for adjustment or tested with simulated ringing failure. Other panels available: portable, manual transfer and supervisory.

TWO MODELS
(Conservative ratings)
Model T: output 25 watts per frequency.
Fits 19″ rack, adapts to 23″ and 30″.
Takes only 17½″ vertical rack space.
Model T50: output 50 watts per frequency.

Write for Bulletin 177A

NEW!



front cover removed

the ideal ringing machine...

THE TRANSISTOR-TYPE

SUB-CYCLE®

★ **ADJUSTS TO ANY FIVE FREQUENCIES**
from 15 to 66-2/3 cycles. Screwdriver adjusts any generator unit to new setting in as little as two minutes.

★ **SELF-PROTECTING**
when ringing into a short circuit.

★ **SINE-WAVE OUTPUT**
...the ideal ringing power.

★ **AUDIBLE RINGING TONE**
Separate generator for 420/40 cycles.

THE ONLY COMPLETE LINE OF POWER EQUIPMENT FOR COMMUNICATIONS

our equipment is sold through leading telephone distributors

FLOTROL® SUB-CYCLE®

LORAIN *Products Corporation*

1122 F Street Lorain, Ohio Phone: ATlantic 8-9191

"REVENUE DOUBLES
WHEN WE SWITCH TO
ALCOA OUTDOOR BOOTHS"
TELEPHONE

reports John E. Caldwell, of United Telephone Company of Pennsylvania

Thirteen Alcoa outdoor booths are popular stop-off points for both vacationers and residents at historic Gettysburg, Pa.

"In many cases where we have replaced indoor booths with outdoor booths of Alcoa® Aluminum, revenue has jumped 100 per cent or more," says Mr. John E. Caldwell, district manager at Gettysburg for United Telephone Company of Pennsylvania.

"Lots of people driving through this area obviously like to stop at these attractive, well-lighted booths to call ahead for reservations or call home. Local residents also make regular use of them. And we like them, too, because they are easy to erect and require only routine maintenance. With aluminum, no painting is ever necessary and cleaning is fast and simple."

United Telephone Company of Pennsylvania now has 120 Alcoa booths in its system. Like many other telephone companies throughout the country, they have discovered that outdoor booths of Alcoa Aluminum boost revenue and profits and gain immediate customer goodwill. Find out how Alcoa booths can do the same for you. Write for free brochure and ask your jobber to show you the Alcoa Goodwill Kit—the free promotional package that comes with every Alcoa booth. Aluminum Company of America, 1721-G Alcoa Building, Pittsburgh 19, Pennsylvania.

"Alcoa's compact construction gives maximum roominess in minimum space, keeps customers from feeling cramped while making a call."

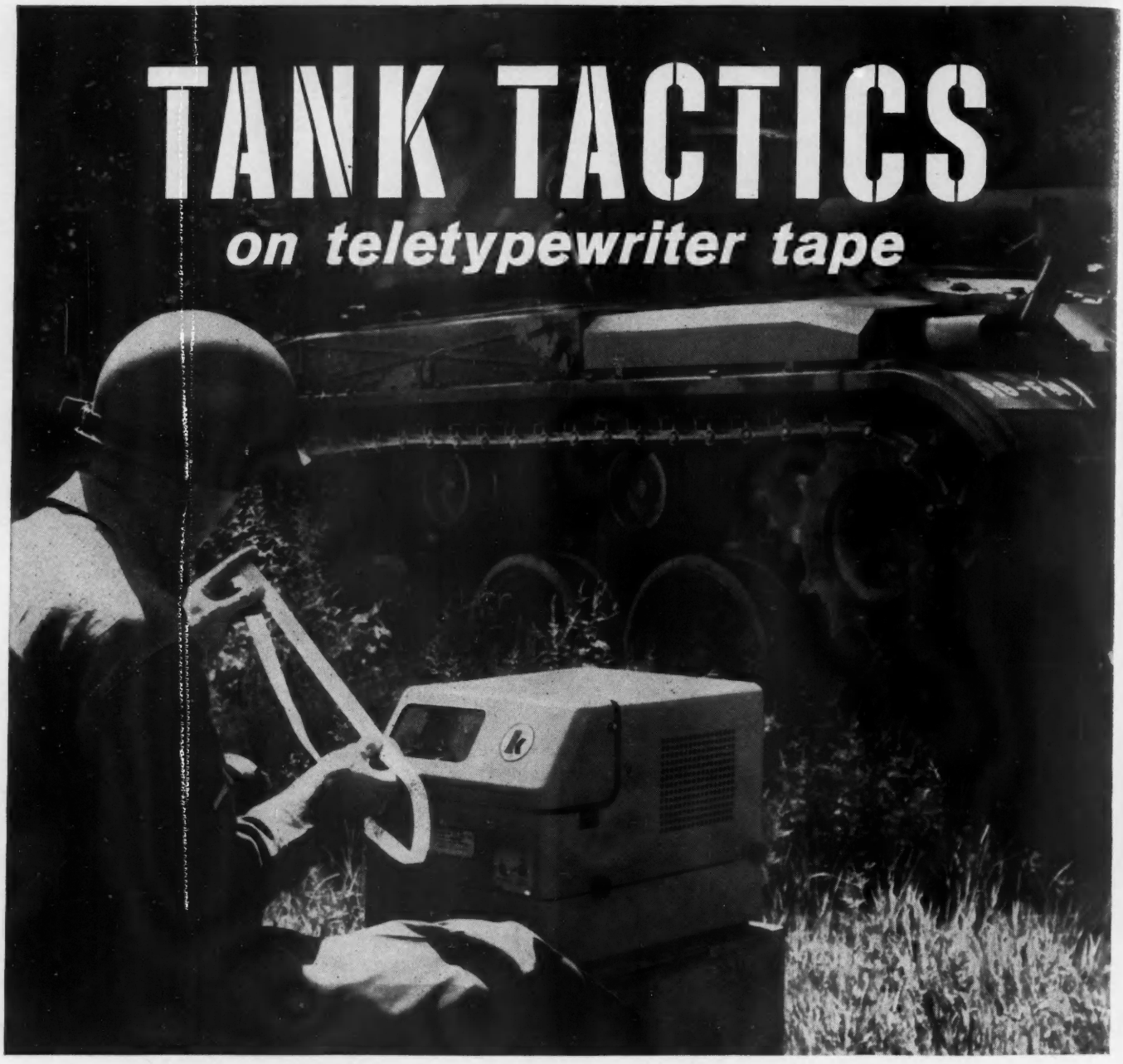
"Continuous lighting in Alcoa booths gives a safe appearance that creates customer goodwill day and night," says Mr. Caldwell.

John E. Caldwell, district manager, United Telephone Company of Pennsylvania, shows why Alcoa outdoor booths are setting new revenue records in Gettysburg: a clean, bright appearance that stays that way—thanks to aluminum's inherent corrosion resistance and sturdy construction.

ALCOA ALUMINUM

Your Guide to the Best in Aluminum Value

For exciting drama watch "Alcoa Presents" every Tuesday, ABC-TV, and the Emmy Award winning "Alcoa Theatre," alternate Mondays, NBC-TV



Capable of reception at speeds of 750 words a minute, new Kleinschmidt unit is world's fastest message printer and code puncher

A major breakthrough in mechanical printing! Developed in cooperation with the U.S. Army Signal Corps, this new super-speed teletypewriter is ten times faster than "standard" equipment, five times faster than normal conversation. In future commercial use it could speed operations such as the transmission of telegrams, stock market quotations, and weather reports. It has important applications in the field of integrated data processing. In recognition of its quality, Kleinschmidt equipment is manufactured for the U.S. Army under the Reduced Inspection Quality Assurance Plan.

KLEINSCHMIDT

DIVISION OF SMITH-CORONA MARCHANT INC., DEERFIELD, ILLINOIS

Pioneer in teleprinted communications systems and equipment since 1911

TELEPHONE ENGINEER
& MANAGEMENT
the
Telephone Industry Magazine

Published on the 1st and 15th
of each month by
TELEPHONE ENGINEER
PUBLISHING CORP.
7720 Sheridan, Chicago 26, Ill.

EDITORIAL STAFF

Publisher
ROY FRANKLIN SMITH

Editor
JOHN G. REYNOLDS

JOHN S. REED
Technical Editor

ROLAND DAVIES &
FRED HENCK
Washington Editors

Contributing Editors
BILL CORMAN
C. D. EHINGER
L. A. GRITTEN
G. M. JONES
LEO SANDS
ALLAN R. STACEY

DICK REYNOLDS
Production Mgr.

JANE KELLEY
Editorial Assistant

ADVERTISING SALES STAFF

DONALD C. SORENSEN
Advertising Manager

BETSY MEYERS
Advertising Assistant

KEITH H. EVANS
& ASSOCIATES
2723 Wilshire Blvd.
Los Angeles 5, Calif.
Tel. — DUnkirk 8-2981
515 Market St., Rm. 225,
San Francisco 5, Calif.
Tel. — YUkon 2-4280

BUSINESS STAFF

ROY F. SMITH
President

DONALD C. SORENSEN
Executive Vice President

JOHN G. REYNOLDS
Vice President

BETTY SCHROEDER
Corporate Secretary

PAT LAWHORN
Circulation Manager

BPA

Member Of
Business Publications
Audit of Circulation, Inc.

TELEPHONE ENGINEER & MANAGEMENT

the telephone industry magazine

VOL. 63, NO. 13 JULY 1, 1959

CONTENTS

FEATURES

The TE&M Editorial — "That Original-Cost Theory" 31
Why Leave The Future To Chance? (Part III) ..... F. E. Norris 33
The "Fletcher-Munson Effect" ..... C. D. Ehinger 37
Four Steps To Sales ..... Allan R. Stacey 43
Inventory Management Methods ..... Dr. G. M. Jones 48

DEPARTMENTS

Industry Observations ..... L. A. Gritten 16
Washington Observations ..... Roland Davies & Fred Henck 20
TE&M's "Electronics Notebook" ..... Leo G. Sands 38, 47
Plant Notes on New Developments ..... John S. Reed 50
TE&M's "Plant Man's 'Spec' Book" 53, 60 61, 65
Questions & Answers ..... John S. Reed 56
Industry News Briefs 68
The Back of The Book ..... John G. Reynolds 80

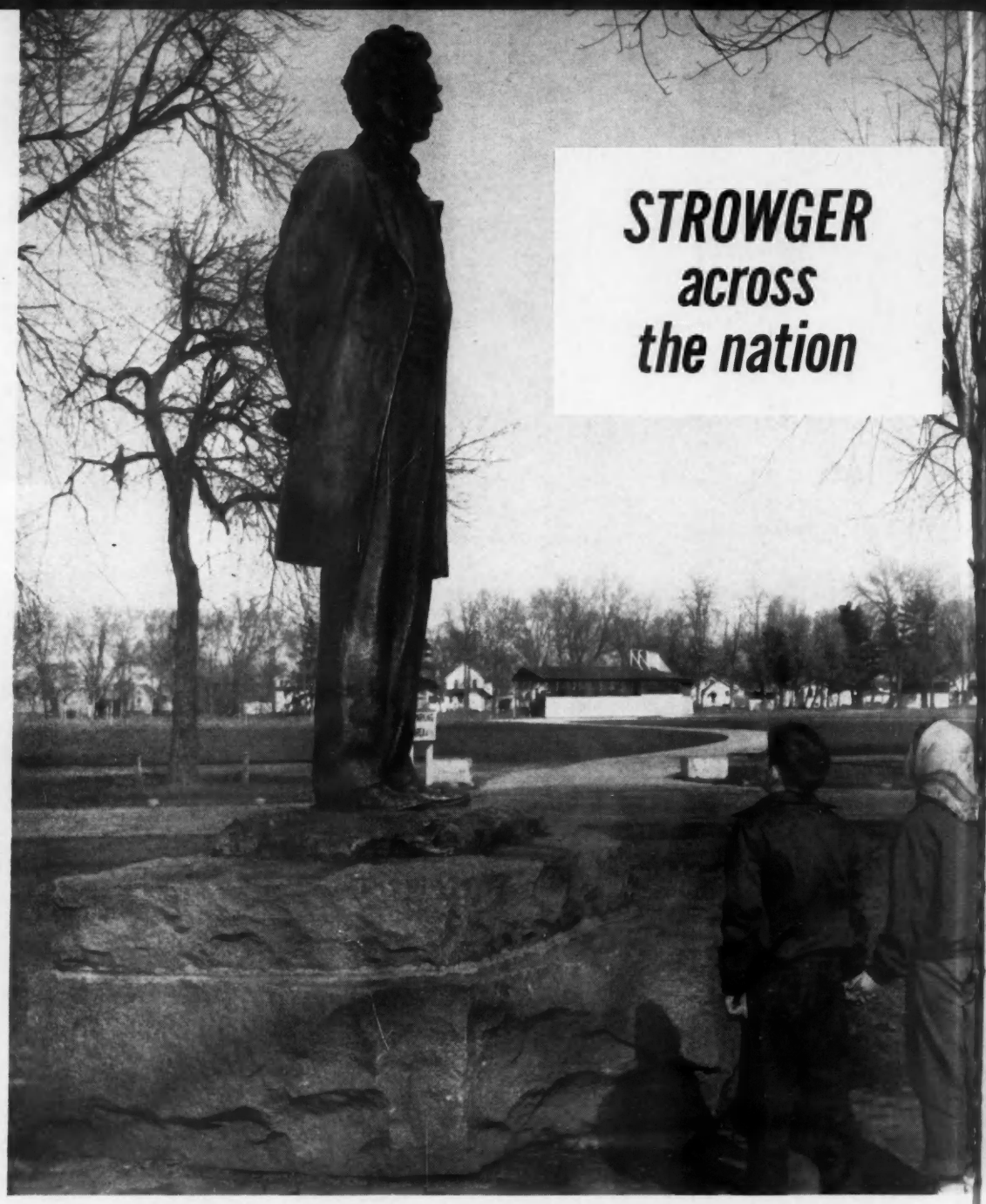
PRODUCTS & SERVICES

New Products' Showcase ..... Dick Reynolds 62
Professional Services 74
Buyers Guide 75
Classified Advertising 76, 77
Advertisers' Index 79

FRONT COVER

Group photo taken during 49th annual convention of the Wisconsin State Telephone Association shows: — (L. to R. — standing) L. J. ROBERTSON, Platteville Tel. Co.; GILBERT A. KARCHER, Burlington Brighton & Wheatland Tel. Co.; E. L. BEYL, Osceola Farmers Mutual Tel. Co.; R. G. PETERSON, Wittenberg Tel. Co.; R. H. KEATING, Amberg Tel. & Tel. Co; ALLAN C BROWN, Rhinelander Tel. Co.; HARRIS G. ALLEN, Northwest Tel. Co.; seated (L. to R.): — G. A. MOEDE, Wisconsin Tel. Co.; PHIL BIGLEY, Viroqua Tel. Co.; F. H. SCHAFER, Urban Tel. Co.; H. B. FLOWER, Wood County Tel. Co.; DONALD W. BUSSE, General Tel. Co. of Wis.; D. H. HANSEN, La Crosse Tel. Corp.; and J. H. HESSELMAN, Mondovi Tel. Co. F. H. Schafer was elected president for the 1959-60 term and L. J. Robertson, vice president. Schafer succeeds H. B. Flower.

Volume 63, No. 13. Published on the 1st and 15th of each month by TELEPHONE ENGINEER PUBLISHING CORP., 7720 Sheridan Road, Chicago 26, Ill. Telephone — Rogers Park 4-3040.
Subscriptions U. S. and Possessions, $4.00 per year; Canada, $4.50; in all other countries, $6.50. Single copies, U.S.A. 50 cents.
Entered as Second Class matter at the post office at Rochelle, Ill. under the act of March 3, 1879. Copyright 1959 by Telephone Engineer Publishing Corp., 7720 N. Sheridan Rd., Chicago 26, Ill.
POSTMASTER . . . Please send form 3579 to TELEPHONE ENGINEER & MANAGEMENT, 7720 N. Sheridan Rd., Chicago 26, Ill.



"LINCOLN, THE DEBATER"
In beautiful Taylor Park, in the outskirts of Freeport, Abraham Lincoln stands as an inspiration to today's children. The statue was erected to commemorate the historic debate between Lincoln and Stephen A. Douglas on August 27, 1858.

STROWGER across the nation

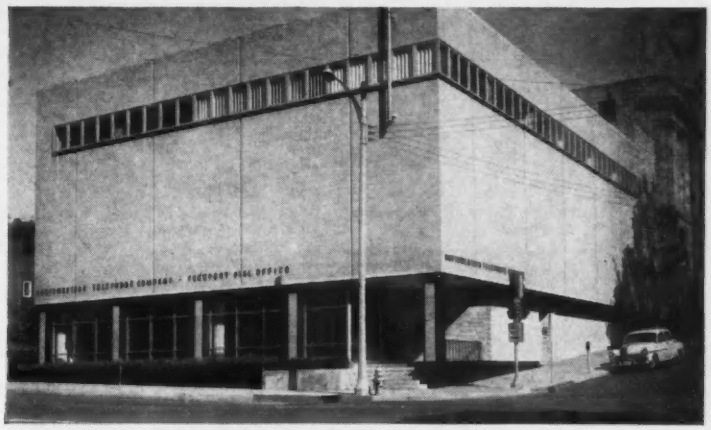
FREEPORT, ILLINOIS

Rugged individualism still flourishes in this historic city where Lincoln & Douglas once debated critical issues before an angry nation

In the heart of America's dairyland, 118 miles northwest of Chicago, lies the charming city of Freeport, Illinois—headquarters of Northwestern Telephone Company. Few cities can equal the beauty of Freeport's city park system. In addition to eight city parks, there are several state parks within a few miles from town.

Freeport, the Stephenson County seat, has a population of 25,650. It serves a trading area of about 85,000 people. Each day—Automatic Electric stepping switches work behind the scenes to give these people dependable, low-cost telephone service. Yes, Freeport is another success story of STROWGER ACROSS THE NATION.

OVER $24,000,000 WORTH of agricultural products were sold by Stephenson County farmers last year. These include dairy products, small grain and hogs.



NORTHWESTERN TELEPHONE COMPANY recently erected this modern building as headquarters for its 16 exchanges. The structure also houses the Freeport business office and exchange. The Freeport exchange, with a total of 14,190 lines, was converted to dial service in March, 1958. Northwestern chose Strowger Automatic equipment to make its conversion.

K. L. SCHROEDER (right) general manager, Northwestern Telephone Company, shows a visitor the historic spot where Lincoln and Douglas debated in 1858. The monument was erected by the Freeport Women's Club and dedicated by President Theodore Roosevelt in 1903.

INSURANCE CAPITAL OF THE MIDWEST

Seven insurance companies have home offices in Freeport! Three, including the Freeport Insurance Company (shown above), have installed Automatic Electric P-A-B-X systems to improve their communications.

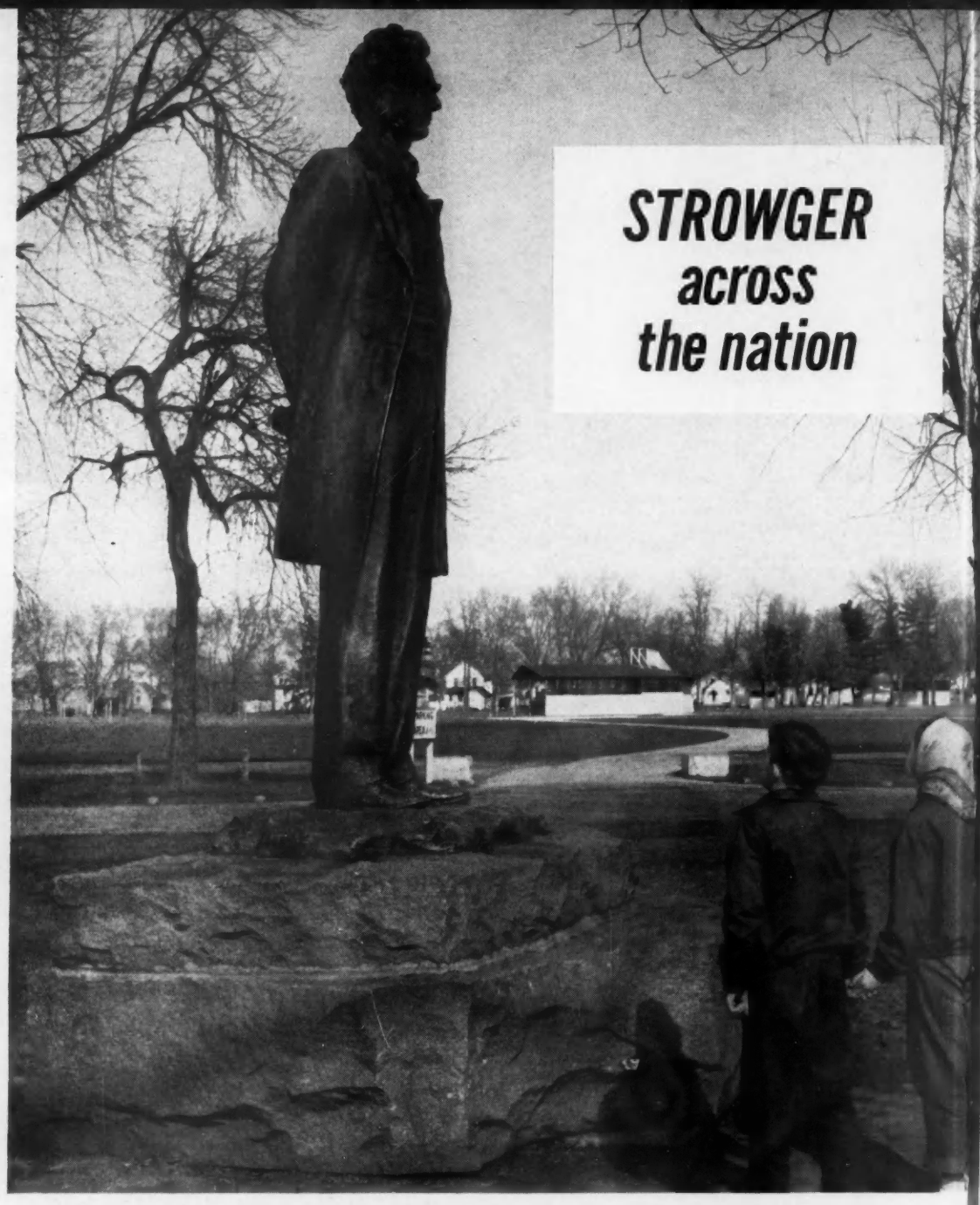
AN EXCITING MOMENT. Just before the Freeport exchange was converted to dial service on March 30, 1958. Sharing in the excitement were (left to right) Raymond Alter, manager, Intra-State Telephone Company, Galesburg, Illinois; K. L. Schroeder, general manager, Northwestern Telephone Company; J. G. Hardy, secretary of the Illinois Telephone Association; and Roy Savage, director, supply sales, Automatic Electric Company.

AUTOMATIC ELECTRIC

Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM



"LINCOLN, THE DEBATER"
In beautiful Taylor Park, in the outskirts of Freeport, Abraham Lincoln stands as an inspiration to today's children. The statue was erected to commemorate the historic debate between Lincoln and Stephen A. Douglas on August 27, 1858.

STROWGER across the nation

FREEPORT, ILLINOIS

Rugged individualism still flourishes in this historic city where Lincoln & Douglas once debated critical issues before an angry natio

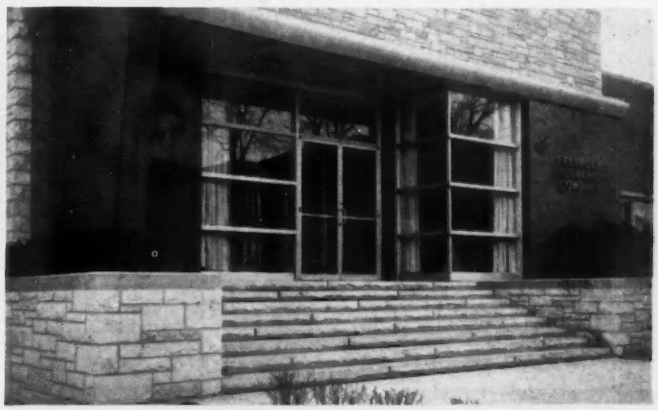
In the heart of America's dairyland, 118 miles northwest of Chicago, lies the charming city of Freeport, Illinois—headquarters of Northwestern Telephone Company. Few cities can equal the beauty of Freeport's city park system. In addition to eight city parks, there are several state parks within a few miles from town.

Freeport, the Stephenson County seat, has a popu lation of 25,650. It serves a trading area of abou 85,000 people. Each day—Automatic Electric step ping switches work behind the scenes to give thes people dependable, low-cost telephone service. Ye Freeport is another success story of STROWGE ACROSS THE NATION.

OVER $24,000,000 WORTH of agricultural products were sold by Stephenson County farmers last year. These include dairy products, small grain and hogs.

NORTHWESTERN TELEPHONE COMPANY recently erected this modern building as headquarters for its 16 exchanges. The structure also houses the Freeport business office and exchange. The Freeport exchange, with a total of 14,190 lines, was converted to dial service in March, 1958. Northwestern chose Strowger Automatic equipment to make its conversion.

K. L. SCHROEDER (right) general manager, Northwestern Telephone Company, shows a visitor the historic spot where Lincoln and Douglas debated in 1858. The monument was erected by the Freeport Women's Club and dedicated by President Theodore Roosevelt in 1903.



INSURANCE CAPITAL OF THE MIDWEST

Seven insurance companies have home offices in Freeport! Three, including the Freeport Insurance Company (shown above), have installed Automatic Electric P-A-B-X systems to improve their communications.

AN EXCITING MOMENT. Just before the Freeport exchange was converted to dial service on March 30, 1958. Sharing in the excitement were (left to right) Raymond Alter, manager, Intra-State Telephone Company, Galesburg, Illinois; K. L. Schroeder, general manager, Northwestern Telephone Company; J. G. Hardy, secretary of the Illinois Telephone Association; and Roy Savage, director, supply sales, Automatic Electric Company.

AUTOMATIC ELECTRIC

Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM

when your
branch exchange
subscriber
requires toll restriction,
remember...

only AE toll restrictors give yo ıes

o nese 4 features:

1

CAN BE USED WITH YOUR CENTRAL OFFICE BATTERY FEED!

Regardless of P-A-B-X size, AE Toll Restrictors can be used with central office battery feed—don't require separate, costlier local battery feed. Also, AE Toll Restrictors can be used with any 48 volt P-A-B-X.

2

NO MODIFICATION OF P-A-B-X TRUNKS NECESSARY!

AE Toll Restrictors never require rewiring of central office trunk circuits. You save time. labor and money.

3

CAN NEVER BE FOOLED BY FALSE DIGITS!

AE Toll Restrictors cannot be unlocked by dialing a "good" digit right after the "9". They do not respond to dialed digits until after central-office dial tone comes back over the trunk.

4

THREE TYPES OF OPERATION!

- ABC, Toll and SATT code restriction for use in Metropolitan areas.
- Toll and SATT code restriction in offices using 2-5 digit-absorbing selectors.
- Toll and SATT code restriction in offices not using digit-absorbing 1st selectors.

With AE Toll Restrictors, your P-B-X and P-A-B-X customers can restrict unauthorized persons from making toll calls. For complete information about AE Toll Restrictors, write: Automatic Electric Sales Corporation, Northlake, Illinois. Or call Fillmore 5-7111.

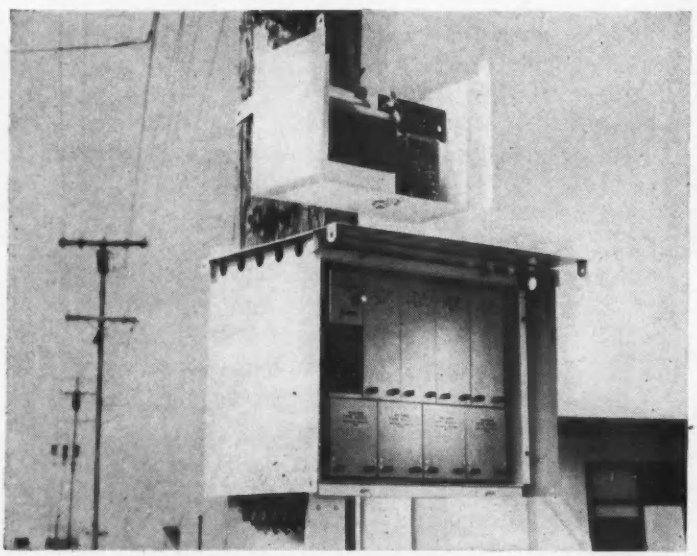
AUTOMATIC ELECTRIC

Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

DOUBLE YOUR CARRIER SYSTEM

WITH KELLOGG'S *exclusive* NEW REPEATER



Subscriber Terminal and stand-by power supply are pole-mounted, quickly installed, simply adjusted. All units are plug-in making it easy to install replacements to meet growth needs.

Only Kellogg's K-31 makes rural subscriber carrier so economical and practical for independents. With Kellogg's exclusive repeaters you substantially increase the length of line over which the K-31 System operates—and at amazingly low cost. Actually, you can *double* K-31 carrier system mileage with one low-cost Kellogg repeater, *triple* mileage with two repeaters!

In addition, Kellogg K-31 Carrier offers these other outstanding features:

Stand-by Power as *standard equipment* (not high-priced "optional")! Sufficient to operate 4 channels for 12 hours if regular power fails.

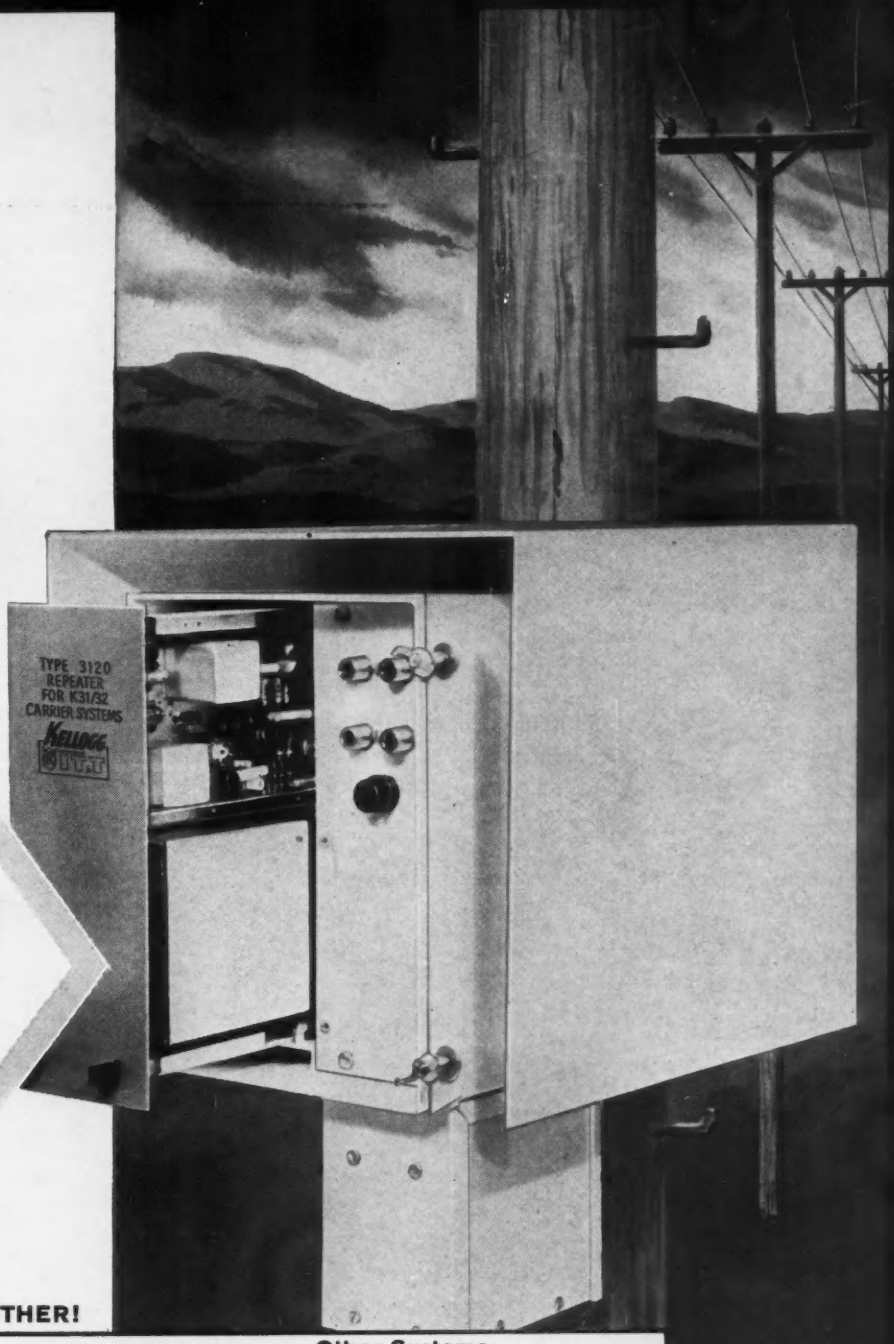
Built-in Compandors! Reduce line noise and cross-talk on open wire line so that marginal circuits meet transmission standards.

Automatic Regulation! Maintains a constant output level regardless of line loss variations due to changing weather conditions.

Completely transistorized! Another Kellogg exclusive! Guarantees toll quality performance.

Important! The *complete* price for the entire K-31 Carrier System, ("no extras") is less than any other comparable system on the market!

YOUR MILEAGE



■ **Double carrier mileage with one low cost repeater!**

■ **Triple carrier mileage with two repeaters!**

MPARE KELLOGG K-31 CARRIER WITH ANY OTHER!

		KELLOGG K-31	Other Systems A	B	C	D
√	Number of channels	8	5	5	5	10
√	Repeaters	yes	no	no	no	no
√	Built-in compandors	yes	no	opt.	no	no
√	Automatic regulation device	yes	yes	yes	no	no
√	Standard emergency power	yes	no	no	no	no
√	Plug-in components	yes	no	yes	no	yes
√	Power consumption (watts)	2.5	30	14	25	35
√	Transistorized printed circuits	yes	no	yes	no	no
√	Transistorized power supply sub. term.	yes	no	no	no	no

Remember Kellogg's K-32 Open Wire Trunk Carrier! Only One Relay on Either End!

Call **KELLOGG** Communications Division of ITT
CHICAGO, ILLINOIS

... and get full details on telephony's most effective and economical *carrier system.*
Exclusive manufacturers of K-31 and K-32 Carrier Systems.

Regional Offices and Warehouses:
CALIFORNIA: 23 Broderick Road, Burlingame, Calif., OXford 7-3780.
GEORGIA: 1594 Southland Circle, N. W., Atlanta 18, Ga., SYcamore 4-2441.
ILLINOIS: 4600 So. Tripp Ave., Chicago 32, Illinois, CLiffside 4-4300.
KANSAS: 7th & Sunshine Road, Kansas City 15, Kansas, MAyfair 1-4418.
MINNESOTA: 6100 Excelsior Blvd., Minneapolis 16, Minn., West 9-6715.
NEW YORK: 327 North West Street, Syracuse, N. Y., HArrison 2-9251.
OHIO: 1555 West Fourth Street, Mansfield, Ohio, LAfayette 4-6511.
TEXAS: 1515 Turtle Creek Blvd., Dallas 7, Texas, RIverside 7-5191.
EXPORT: 157 Prospect Street, Passaic, N. J., PHescott 3-5100.

Kellogg Switchboard and Supply Company, 6650 South Cicero Avenue, Chicago 38, Illinois.
Communications Division of International Telephone and Telegraph Corporation.

NEW!
LEICH
Subsidiary of GENERAL TELEPHONE & ELECTRON
GENERAL SYSTEM

NEW!

Leich's L55 Floor-type PBX

Here's the switchboard that increases your PBX sales, and saves you money, too. Leich's L55 PBX is not only attractive, durable, and easy-to-operate, but also reduces your maintenance and expansion costs. What's more, it gives your larger subscribers all the service features that they most desire.

Formica-type Cabinets

Leich's formica-type cabinets are non-flammable and stain-resistant. They're available in standard finishes of mahogany, walnut, and blond ash to complement your subscribers' furnishings. An unfinished bay poplar plywood cabinet is available on request.

Unique Keyboard Arrangement

A simplified keyboard arrangement lets the operator handle calls easily, and gives her more room to perform other office duties. Both push-button ringing keys and twist-push type talk keys are conveniently located in a sloping position above the writing shelf. Talk keys serve as night answering keys by simply pushing them in.

Jack-in Circuits

Jack-in cord circuits, operator's circuit, and central office trunks let you add, remove or service equipment quickly and economically. Leich's new cord circuits also allow for maximum range. There's less need for long line relay equipment at the PBX to handle off-premises extensions.

Two Sizes Available from Stock

Two basic models, the L55-A3 and L55-B4, are available from stock, and can be delivered within 30 days. Additional lines, trunks and cords may be ordered up to capacity, plus other service features, such as conference and tie trunks.

MODEL L55-A3			MODEL L55-B4	
Wired	Equipped		Wired	Equipped
60	30	Station Lines	80*	40
14	6	C. O. Trunks	14	8
15	8	Cords	15	10
1	1	Operator's Circuit	1	1

*Capacity: 120 lines.

Write today for more information.

CH SALES CORPORATION • 427 WEST RANDOLPH STREET • CHICAGO 6, ILLINOIS

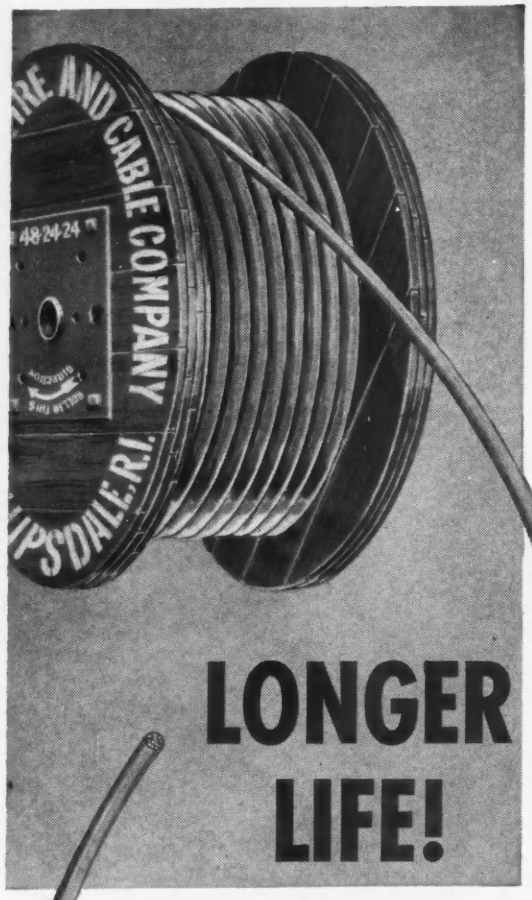
COAST: 11401 W. PICO BLVD., LOS ANGELES 64, CAL.

EAST: 3651 CONNECTICUT AVENUE, YOUNGSTOWN, OHIO

WEST: 1227 SLOCUM STREET, DALLAS 7, TEXAS

SOUTHEAST: 5126 SOUTH LOIS ST., TAMPA 11, FLORIDA

nufacturers of telephones, switchboards and related apparatus since 1907



LONGER LIFE!

When you talk about Kennecott lead-alloy sheathed cable, longer life REALLY MEANS SOMETHING! It means retention of full electrical properties over the *entire* long, long life of the cable. That's because every component that goes into Kennecott Telephone Cable—from copper conductor to superior, uniformly strong "Young Process" lead sheath—is checked and tested. Flaws, imperfections and inferior materials are ruthlessly eliminated. Get complete information on Kennecott Telephone Cable from the Chase sales office near you.

IT'S KENNECOTT TELEPHONE CABLE

INDEPENDENT

CHASE BRASS & COPPER CO., WATERBURY 20, CONN.
Distributor for the Products of the

KENNECOTT WIRE & CABLE DIV.
of The Okonite Company

CHASE WAREHOUSES and OFFICES:

Atlanta	Cincinnati	Grand Rapids	Milwaukee	New Orleans	St. Louis
Baltimore	Cleveland	Houston	Minneapolis	Philadelphia	San Francisco
Boston	Dallas	Indianapolis	Newark	Pittsburgh	Seattle
Charlotte	Denver	Kansas City, Mo.	New York	Providence	Waterbury
Chicago	Detroit	Los Angeles	(Maspeth, L. I.)	Rochester	

RECONDITIONED TELEPHONES

W.E. Kellogg late type #500 sets with new black cases. Reconditioned with st. line ringers.

Price with dial $19.50
Price dial blank $16.50
Price with dial, less ringer $16.50
(install your cycle ringer)

W.E. #302 ★ A.E. #40 ★ Kellogg #1000 ★ Stromberg-Carlson #1243 self contained desk sets. Recond. With met. dial and st. line ringers. Cycles on request.

Price with dial $12.50
Price dial blank $10.50
As is working order;
Price with dial $10.50
Price dial blank ..... $ 8.50

LEICH 901 MAGNETO DESK OR WALL Late type instruments with 1600 ohm ringers & strong generator for those long rural lines. Can convert to C.B. or dial.

Price recond. with coil cord $20.50
Price as is working order $15.00

TERMS: OPEN ACCOUNT FOR YOUR INSPECTION TO RATED FIRMS

REQUEST CATALOG: wire, cable, trucks, hardware, switchboards, test sets, parts, tools.

BOHNSACK EQUIPMENT CO.
Germantown, N. Y. Tel. 213 or 214

HAVE YOU TRIED THEM?

Hi *Plastic* SCREW ANCHORS

FREE SAMPLES!

FASTEN ANYTHING, ANYWHERE . . . OUTDOORS OR INDOORS

TREMENDOUS HOLDING POWER — Here's the modern (and the best) anchor for screws. Saves up to 70%! Sold in handy plastic kits (just the thing for tool box and truck) . . . and in cartons.

LIFETIME ANCHOR
Sizes for No. 4 screw up to ½" lag . . . and every anchor is size-marked.

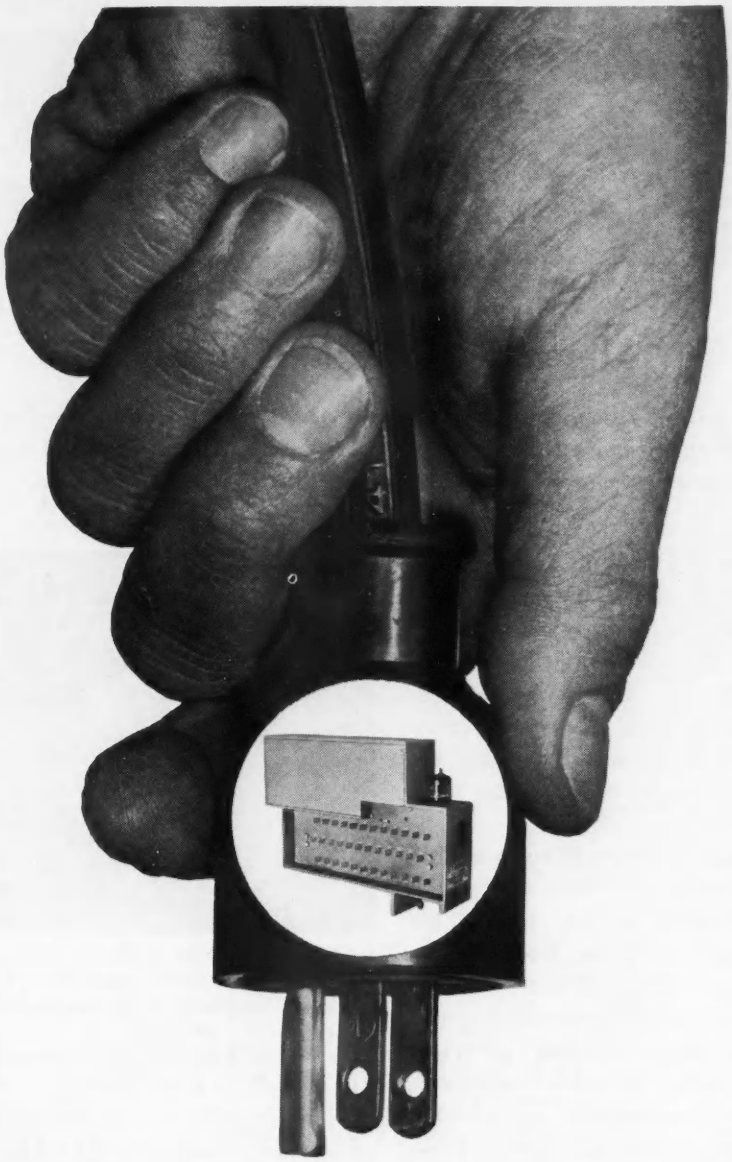
MILLIONS IN USE!

SEND SAMPLES OF PLASTIC ANCHORS

NAME_____
FIRM_____
STREET_____
CITY_____ STATE_____

Hi TRADE MARK REG.

HOLUB INDUSTRIES, Inc.
471 ELM STREET • SYCAMORE, ILL.



SAVE "COPPER DOLLARS"...PLUG IN HALLAMORE E-REPEATERS

Hallamore field engineers, working with telephone company engineers and engineering consultants, have discovered how to save your company "copper dollars," when building new outside plant or when bringing about transmission improvement on existing facilities. Using Hallamore produced, negative impedance E-Repeater equipment, field-proven as most economical and trouble-free, they plug in versatile amplifying power, instead of hanging—or burying—costly copper cable. 15 circuits or 1500, there are important economies in the application of Hallamore E-Repeaters and allied equipment. A qualified Hallamore engineer will be pleased to consult with you, or we will send detailed descriptive material at your request. *Note...Immediate delivery is available.* Hallamore Electronics Company, Telephone Dept., 714 Brookhurst St., Anaheim, Calif. • A Division of The Siegler Corporation.

Distributed by GraybaR

HALLAMORE

Economics of E-Repeater Installation Told by Hallamore Transmission Engineers

TELEPHONE COMPANY engineers and engineering consultants are finding important savings for their companies and clients, while maintaining, or increasing efficiency of operation, with the application of E-type repeaters.

As an example; installed costs per circuit mile of cable are estimated as follows: 24H88—$78.00; 22H88—$90.00; 19H88—$114.00. And two recent E-Repeater installations presented the following picture (including repeaters and all associated equipment, such as mounting shelves, power distribution panels, and 130 volt power supplies): 100 E2 Repeaters—$110.77 per circuit; 54 E2 and E3 Repeaters—$226.35 per circuit (one E2 and one E3 Repeater were used on each of these circuits to obtain high gain).

With the obvious difference of $24 per circuit-mile between 19 and 22 gauge cable and $28 per circuit-mile between 22 and 24 gauge cable, it takes very little distance to "prove in" E-Repeaters.

Use of finer gauge wire makes possible placement of cable carrying many more pairs, with resultant underground duct and pole line savings. An additional sizeable capital saving is realized because of the fact that all the repeaters are not required with the initial cable installation. Repeaters are purchased only as neeessary to accommodate circuits actually in use.

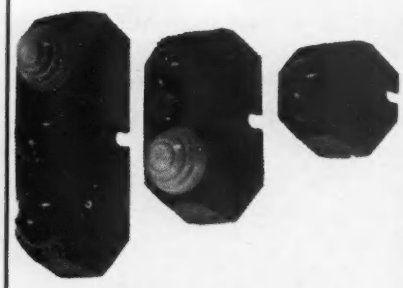
When changing the wire center for an area, it is not necessary to replace existing copper to obtain transmission improvement. Leave in the old fine gauge plant—just add repeaters as required.

There are more E-Repeaters in operation today than those of any other design. They are still the most stable and uniformly reliable negative impedance repeaters on the market—yet the best costs no more.

WHAT'S NEW AT

SUTTLE

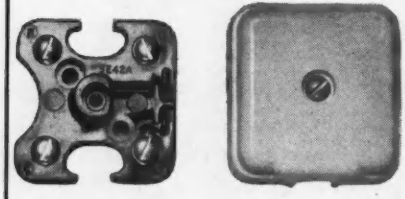
TOP VALUES



New "All Purpose" Indicator Lights

For use wherever a visual signal is needed. Manufactured by **SUTTLE**, these lights are used in offices, hospitals, factories, mills, residences, etc. Order a sample set today from **SUTTLE** or your local distributor to show your subscribers. Order in any combination of white, ruby or green.

SE 15 Indicator Light (1 lamp) $2.30
SE 17 Indicator Light (2 lamps) $3.80
SE 18 Indicator Light (3 lamps) $4.70



4-Point Blocks and Plastic Covers

Only **SUTTLE** mfg's. the independent industry's standard four-terminal connecting block with non-shorting plastic covers. Available in brown, black or ivory. Covers are high dielectric plastic — completely shorting resistant. For fast delivery of connecting blocks and covers, send your orders today to **SUTTLE**, or your local distributor.

SE 42A — **$.36** each.

SUTTLE EQUIPMENT CORP.

401 N. 15th St., Lawrenceville, Ill.
Phone: Lawrenceville 782

135 S. La Salle St., Chicago 3, Ill.
Phone: DEarborn 2-3108

INDUSTRY OBSERVATIONS

by L. A. GRITTEN

"About That Hoffa Threat"

Before following through on its threat of a general strike, the Hoffa group should read a little history and learn what happened 33 years ago when a general strike was called in Great Britain.

America Vs. Hoffa

JAMES R. Hoffa, the second most powerful man in America, threatens us with a general strike. Senator McClellan says: "Don't minimize or underestimate the dangers . . . involved in this threat . . . They are real and something must be done about them."

We must go back 33 years to find a comparable menace to a great industrial nation. On May 3, 1926, the general council of the Trades Union Congress of Great Britain called a general strike, in support of the striking coal miners. Railway and transport workers, printers, electricians, building tradesmen, engineering craftsmen, nearly all of the union workers, were called out. Only a few essential sanitary services were permitted to continue. At once there was stagnation. Business throughout the country stopped. No wheels turned, no newspapers were published, ships stood idle at the docks, the nation faced ruin. To enforce the demands, just or unjust, of the miners, a few powerful labor leaders were prepared to strangle their country.

They underestimated the patriotism, courage and good sense of middle-class people, who refused to stand by and see their country bled to death. The great "white collar" class showed what it is made of. Businessmen, clerks, secretaries, shop assistants, accountants, fishermen, farmers, bankers, lawyers and students, backed by the government, turned to the business of learning in a few hours enough to enable them to drive the trucks, pull the switches, run the presses and keep the wheels turning. Theirs was the spirit that saved civilization 14 years later on the beaches of Dunkirk. They made blunders innumerable, of course, but despite the odds against them, they kept things limping along. They learned enough to "muddle through somehow."

L. A. GRITTEN'S "Industry Observations" appear exclusively in "Telephone Engineer & Managemnt."

In nine days the general strike was broken by the people. On May 12 the strikers returned to work with nothing gained but regrets; their leaders were discredited and defeated. One of the immediate results was legislation that limited union activities and banned general strikes.

American people will be as willing and as competent as their British counterparts to frustrate any similar attempt to strangle this country. It might be well for Hoffa's group to read a little history.

* * *

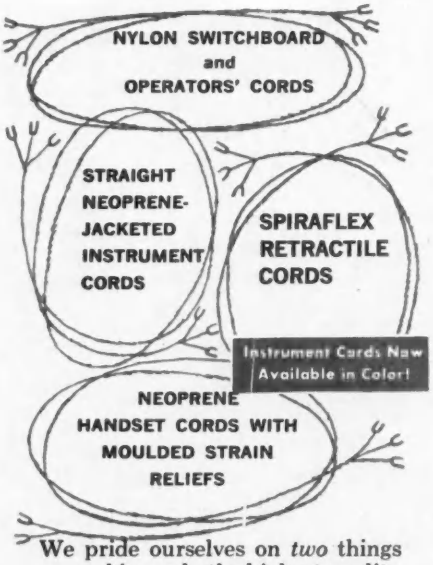
Fast and Informal

A MANUFACTURING concern has returned our letter of enquiry with the answers to our questions handwritten on the face. Clipped to

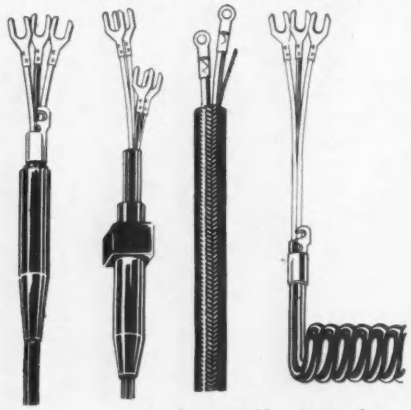
EXPAND AND IMPROVE TELEPHONE SERVICE

with "561" Subscriber Carrier • "541" Negative Impedance Voice Repeaters • "551" Hybrid-Type Voice Repeaters by Stromberg-Carlson

NEED CORDS IN A HURRY?


NYLON SWITCHBOARD and OPERATORS' CORDS
STRAIGHT NEOPRENE-JACKETED INSTRUMENT CORDS
SPIRAFLEX RETRACTILE CORDS
Instrument Cords Now Available in Color!
NEOPRENE HANDSET CORDS WITH MOULDED STRAIN RELIEFS

We pride ourselves on *two* things . . . making only the highest quality cords—and, making prompt deliveries . . . a combination which spells complete *customer satisfaction!* Why not give us the opportunity to prove these points to you.



A phone call, wire or letter will bring you a catalog, samples and prices.

COMMERCIAL CORD COMPANY, INC.
CLIFTON SPRINGS, N. Y.
Phone: HOward 2-2311

QUALITY CORDS FOR ALL MAKES AND TYPES OF TELEPHONE INSTRUMENTS

the letter was a printed slip, courteously explaining that this informality saved time and gave us faster service. That might be a good idea for utilities to imitate. Dictated and formal letters take time and cost over a dollar apiece; and a delayed answer to a minor complaint may lead to a major and costly irritation.

* * *

Extended Area Blues

CERTAINLY there is no health in 10-cent toll calls; but the rapid spread of the alternative, Extended Area Service, has been bad medicine for many Independents. As between contiguous Bell exchanges, certain Bell companies are opposed to charging the cost of EAS to the larger exchange; they do not necessarily charge all of the cost to the smaller exchange; the resulting loss can be absorbed elsewhere. When this is applied to EAS between a Bell exchange and a small Independent, the Independent is faced with the necessity to impose an excessively high exchange rental to offset his loss in toll revenue and his outlay in EAS equipment.

Usually, the requests for EAS have been sedulously promoted in the first place by a vociferous minority of businessmen in both exchanges. The inactive majority in the smaller city, caught by the "toll free" bait, realize too late that it would be cheaper for them to pay long distance rates for the little inter-city talking they need.

EAS is a service established as an alternative to long distance. Consequently, any losses sustained by an Independent in installing EAS to a Bell exchange call for compensation by the Bell company. The Independent canot be expected to operate at a loss. Nor should he be compelled to antagonize his subscribers by saddling them with excessively high rentals for a service that the Bell subscribers at the other end enjoy without any extra charge.

* * *

"Don't Broadcast It!"

IF YOU WISH to tell the truth about someone you don't like — and who does not, occassionally? — stay away from radio and television. A precedent-setting decision by the New York Supreme Court has enlarged the scope of actions for libel.

Legally speaking, libel is a more serious offense than slander. Hitherto, to be classed as libel, one's defamatory remarks had to be written. Under the New York decision, defamation that is broadcast over the air now becomes libel. Apparently, defamation by telephone to an individual is still merely slander.

So, if you cannot resist the urge to tell the world what sort of a so-and-so that such-and-such really is, stick to your telephone. Better still, get elected to Congress. You can then say anything about anyone, with immunity and impunity.

* * *

Let's Sell Extensions

ACCORDING to recent statistics, the most-favored location for an extension telephone is the kitchen. Without benefit of commercial surveys, we are prepared to bet a king-size cigar that the most unlikely place is the bathroom or powder room. An extension is seldom found there, yet logically it is the best location. When one is there — well, one is there. If the phone rings elsewhere, it rings. Milady misses many a call, because of a Victorian objection to dashing from her bath and running nude through the house, trailing bubbles and profanity. Then, why no phones in bathrooms? Could it be that our salesmen are too coy and bashful to present the facts of life forthrightly to the housewives? — *Leslie A. Gritten.*

Fishing Derby at Ilwaco, Wash.

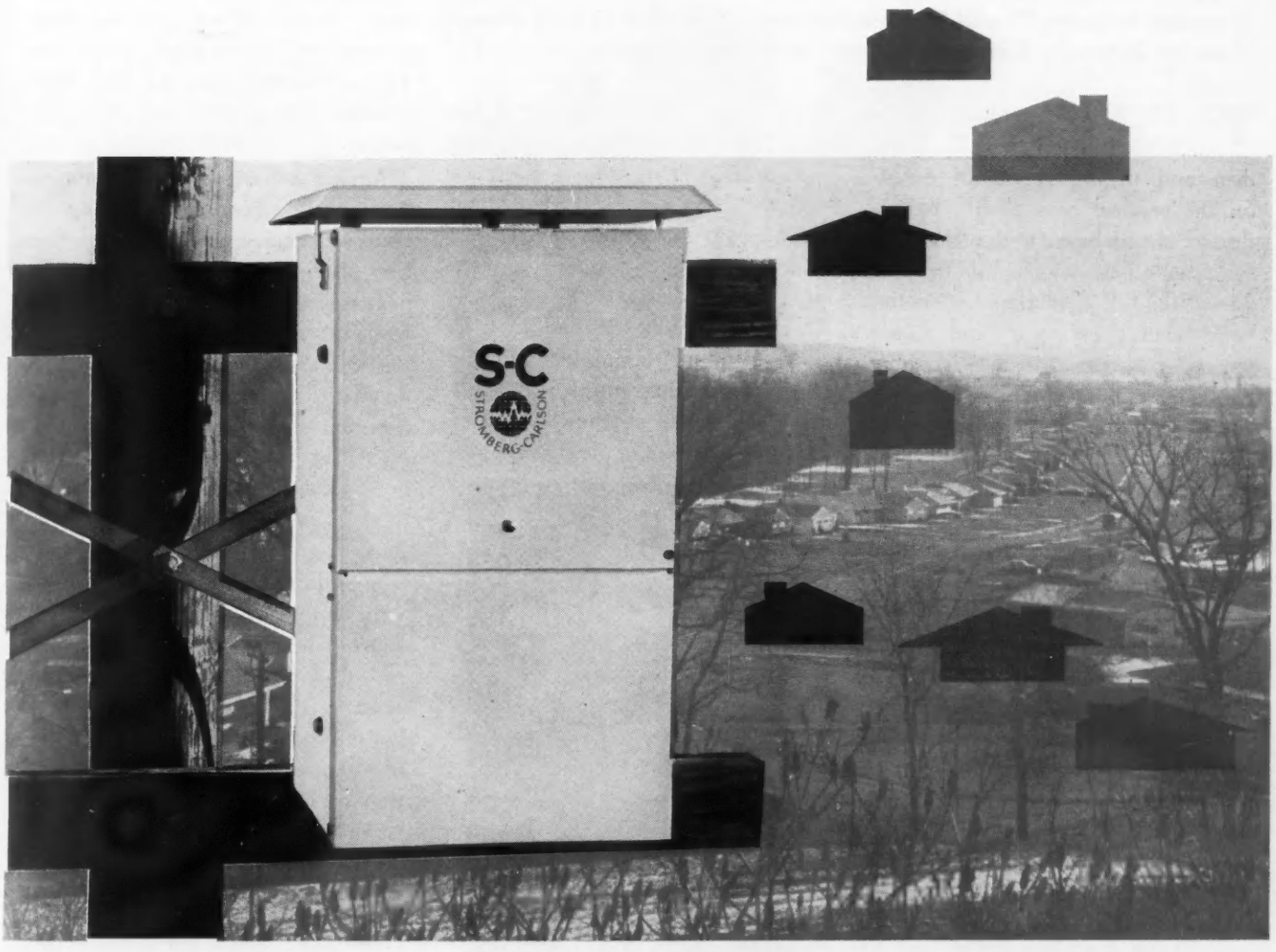
NORMAN A. HOWERTON, president of Telephone Utilities, Ilwaco, Wash., has extended a cordial invitation to all telephone men and their friends, to take part in the second annual *Telephone Fishing Derby.* The affair, which is planned and sponsored by the Telephone Utilities Inc., will be held at Ilwaco, Wash., August 11.

Reservations for motel accommodations, boats and fishing equipment, should be made by August 1, to Mr. Howerton. His address is c/o Telephone Utilities Inc., Ilwaco, Wash. Telephones: Ilwaco MISSION 2-5212 or MISSION 2-4841.

"561" SUBSCRIBER CARRIER

Transistorized, low-cost, flexible

With Stromberg-Carlson "561" Subscriber Carrier you expand service without the high cost of conventional methods. Flexibility assures quick, easy addition of service in fast-growing areas. Get full details from your Stromberg-Carlson representative.



STROMBERG-CARLSON A DIVISION OF GENERAL DYNAMICS CORPORATION

ATLANTA: TRinity 5-7467 • CHICAGO: STate 2-4235 • KANSAS CITY: HArrison 1-6618
ROCHESTER: HUbbard 2-2200 • SAN FRANCISCO: OXford 7-3630

S-C STROMBERG-CARLSON | GD GENERAL DYNAMICS

WASHINGTON OBSERVATIONS

by ROLAND DAVIES and FRED HENCK

IMPACT of communications users' letters to Congress on excise tax shows up in House debate on adoption of one-year extension . . . BURTON W. SAUNDERS tells Senate Labor sub-committee proposed amendment to FLSA would produce adverse economic and operational impact . . . WALTER G. WRIGHT appears as witness at FCC hearings on future allocation and use of the frequency spectrum between 25 and 890 megacycles . . . J. G. BONNAR named assistant director, Communications Industries Division of BDSA.

THE IMPACT of communications users' writing to their Congressmen and urging repeal of excises on the services was clearly evident during the debate in the House of Representatives which led to passage of the bill extending for another year existing excise tax rates on a variety of items — not including communications, which is one of the excises not subject to annual extension — and the present 52% corporation income tax rate.

More than a half dozen members of Congress referred to communications or telephone excises in one way or another, generally in connection with demands that the federal budget should be balanced, government spending reduced, or the national debt cut back.

As Senate action was awaited on the measure, the possibility was seen of support in the Senate for a proposal by Senator Robert S. Kerr (D., Okla.) to terminate the communications levies June 30, 1960, the end of the upcoming fiscal year.

Prospects of endorsement by the House in conference or on the floor of any Senate amendment to repeal the communications levies immediately were dampened by the statement by Chairman Wilbur Mills (D., Ark.) of the House Ways & Means Committee that the committee "restrained itself" from proposing communications and other tax reductions "on the specific assurance that if we would report this as a straight extension, the administration would oppose moves to add any amendments that would reduce the revenues.

"Thus we were assured that the administration, certainly, will oppose amendments and I will assure the House, here and now, I will endeavor to maintain the House position, if I get into a conference, because I do not want the House to be put in a position of not being able to exercise its will with respect to some of these proposed reductions and then have to take something because it was put on somewhere else." Throughout the House debate on the subject, Mr. Mills stressed the government's need for money.

BURTON W. SAUNDERS, pres., General Tel Co. of Illinois, urges Senate Labor subcommittee to postpone proposed amendment to FLSA which would limit telephone operator exemption to points where service is provided through a switchboard in the operator's home.

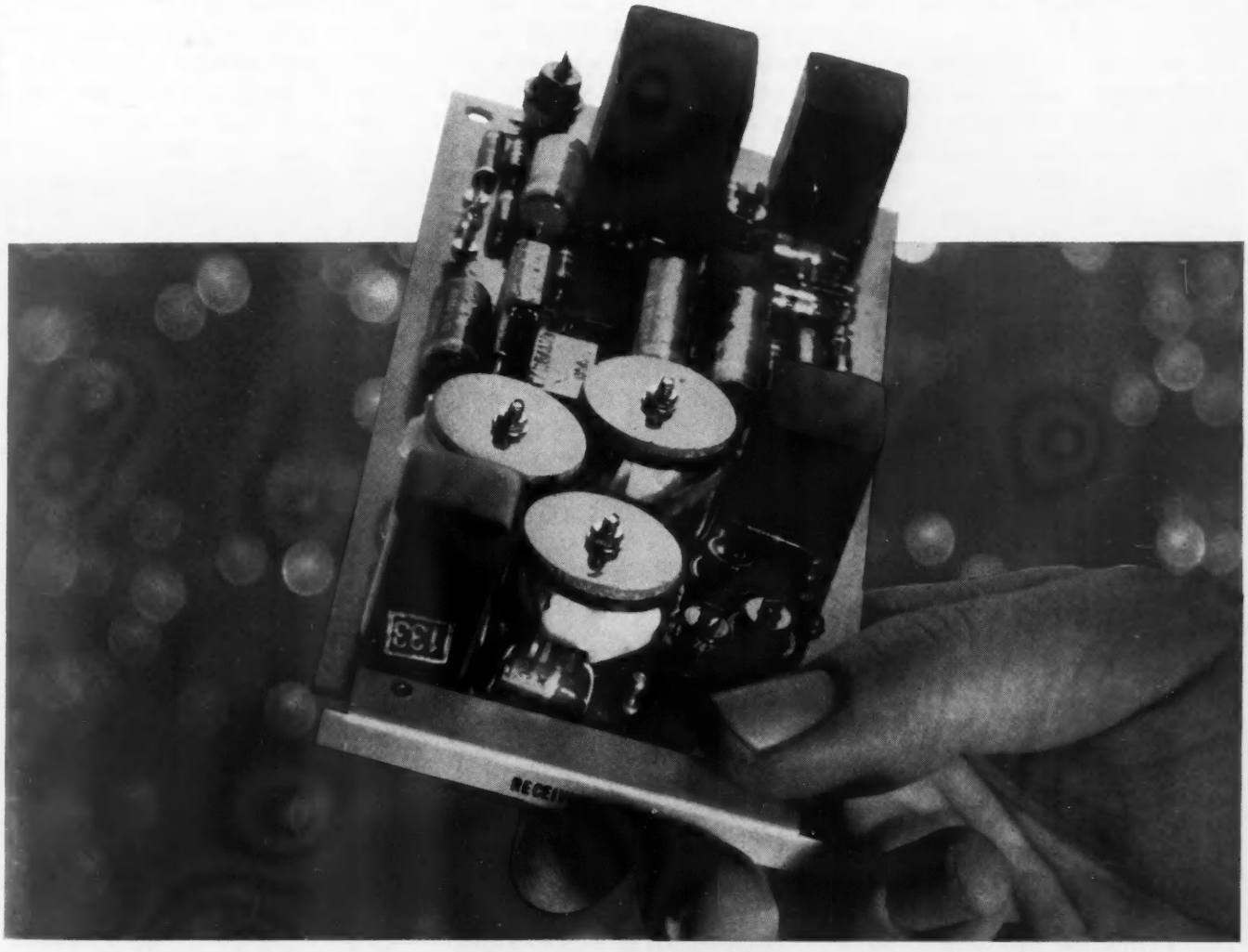
Among references to communications or telephone taxes during the House debate were those by Rep. Leo Allen (R., Ill.), ranking Republican on the Rules Committee, who made it a point to comment that the extension bill had nothing to do with communications or transporation taxes; Rep. John L. McMillan (D., S. C.), who asked if consideration had been given to reducing communications excises; Rep. Clare Hoffman (R., Mich.), who inquired about the "sense" of writing to constituents that there is a prospect that communications taxes will be reduced; Rep. John Lesinski (D., Mich.), who pointed to his bill to reduce or repeal a number of excises, including communications; and Rep. James B. Utt (R., Calif.), who remarked that communications taxes cannot be reduced unless government spending is cut.

During the present session of Congress, more than 80 bills have been introduced calling for reduction, repeal or setting a termination date on communications excises. As of this writing, Senate action on the tax bill was still awaited, but it will be remembered that it was in the Senate in 1958 that a termination date was applied to the tax on the transportation of freight, and

"561" SUBSCRIBER CARRIER

Amazingly simple to install and operate

Both central office and subscriber terminals employ plug-in printed circuit boards for easy installation and routine inspection.
Careful circuit design results in long life and exceptional reliability.
Contact your Stromberg-Carlson representative.



STROMBERG-CARLSON A DIVISION OF GENERAL DYNAMICS CORPORATION

ATLANTA: TRinity 5-7467 • CHICAGO: STate 2-4235 • KANSAS CITY: HArrison 1-6618
ROCHESTER: HUbbard 2-2200 • SAN FRANCISCO: OXford 7-3630

at the same time amendments to reduce or repeal communications imposts were defeated by relatively close margins.

On the tax front, another proposal which is getting to be something of a "hardy perennial" has been submitted to Congress again; the proposal that part of the excise tax on local telephone service be shifted to the states along with a transfer of responsibility for financing programs of waste treatment works construction and vocational education.

The subject has been revived again this year with the transmission to Congress by the administration of legislation setting forth procedures for the transfer. Budget Director Maurice Stans has sent to Congress a bill which spells out methods for making such a tax transfer and seeking to meet earlier Congressional objections to such a plan.

The House Government Operations Committee in 1958 had rejected the telephone tax transfer proposal as an "intriguing idea" but "impracticable," and there appears little likelihood that the proposal will make any more progress in Congress at this year's session.

The Joint Federal-State Action Committee (composed of state governors and cabinet-level federal officials), as an outgrowth of studies which started at the suggestion of President Eisenhower following the 1957 Governors' Conference, had proposed a transfer of 4% of the local telephone service tax to the states to help finance the waste treatment and vocational education programs.

After the House Committee rejected this plan, the Action Committee modified the proposal to set up a program of tax credits for the states for a five-year period and for a method of distributing funds.

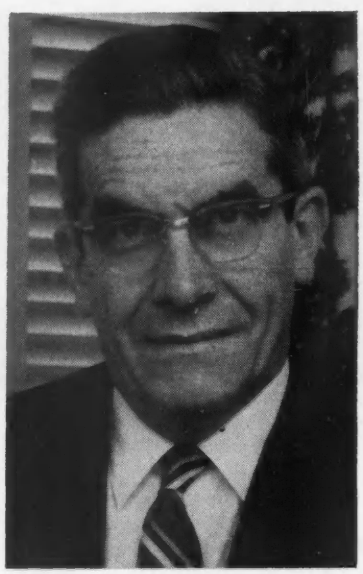
Gen. Tel. Witness Opposes Amendment to FLSA

PRESIDENT Burton W. Saunders, of the General Telephone Co. of Illinois, appearing as a witness for General Telephone System, told a Senate Labor subcommittee that he is opposed to the proposed amendment to the Fair Labor Standards Act which would limit the telephone operator exemption to points where service is provided through a switchboard in the operator's home, because of the proposal's "ambiguity and its impractical effect."

Mr. Saunders stated that the proposed amendment to the present 750-station exchange exemption would: produce an adverse economic and operational impact; necessitate rate increases for telephone subscribers; and create an imbalance in the labor markets of the communities where such exchanges are located.

But if there is to be any amendment or removal of the exemption, the Illinois General official said, "I strongly urge this committee that its effect be postponed for a minimum of five years, so that my company and other operating companies in the General System will have the opportunity to schedule the conversion of manual exchanges to dial operation on an economic, orderly, and well-planned basis."

The position of Mr. Saunders was challenged during the questioning by Sen. John Kennedy (D., Mass.), Chairman of the subcommittee and author of the FLSA legislation under consideration, and Sen. Joseph Clark (D., Pa.), who devoted many of their questions to the fiscal operations of the General System.



WALTER G. WRIGHT, vice president-operations, General Telephone & Electronics Corp., appears as witness at FCC hearings.

Mr. Kennedy took the view that the General System is "big business" and thus the attitude of Mr. Saunders, as its spokesman, was difficult to understand. Both of the Senators at the hearing directed a large part of the questioning to revenues and earnings of the General System, matters dealing with stock dividends, its net worth, and similar matters.

Mr. Saunders, in discussing the effects on his company of an end to the present exemption, said the costs of operating manual exchanges where the exempt status was removed "would skyrocket. My company would be forced to institute a crash program for the conversion of such manual exchanges to dial because of the prohibitive operating costs which would be incurred."

The General of Illinois President cited figures related to his company and the General System, as a whole, to show the cost effects if the 750-station exemption were ended. In addition, he voiced opposition to the proposal to raise the present minimum wage to $1.25.

Using his own company as an example, he said that operating expenses for General of Illinois in 1958 were about $16,000,000 before taxes. If the 750-station exemption were amended as proposed and the minimum wage raised to $1.25 an hour, total additional operating expenses for the company would increase by about $660,000 or 4.1%, he said.

If the exemption were to be eliminated entirely and the minimum wage increased, total additional operating expenses on an annual basis would increase by an estimated $970,000, or about 6.2%, Mr. Saunders declared.

Walter Wright Testifies at FCC Hearings

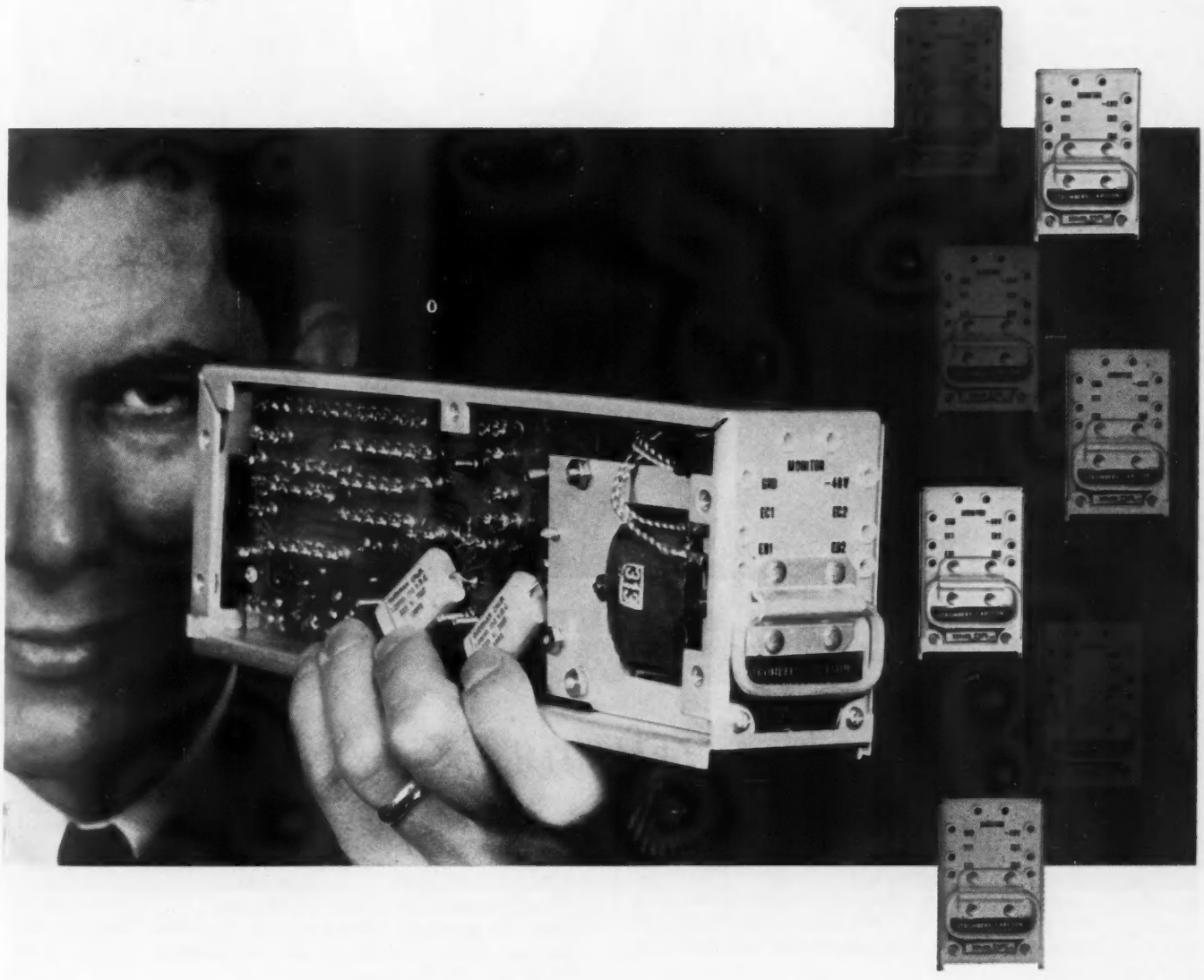
AS A WITNESS in the Federal Communications Commission's lengthy oral hearings on future allocation and use of the frequency spectrum between 25 and 890 megacycles, Walter G. Wright, Vice President operation of the General Tele-

Please turn to page 71

"541" REPEATERS

More decibels for your dollar

100% transistorized "541" Negative Impedance Voice Repeaters (series and shunt type) give you years of service without replacement; lowest power drain; reduced cable loading; greatest saving. Get details from your Stromberg-Carlson representative.



STROMBERG-CARLSON A DIVISION OF GENERAL DYNAMICS CORPORATION

ATLANTA: TRinity 5-7467 • CHICAGO: STate 2-4235 • KANSAS CITY: HArrison 1-6618
ROCHESTER: HUbbard 2-2200 • SAN FRANCISCO: OXford 7-3630

S-C STROMBERG-CARLSON | GD GENERAL DYNAMICS

New ORANGEBURG® CA* CONDUIT *with Flush Coupling Attached!*

With no separate couplings to handle or attach on the job, Orangeburg CA lays faster, costs less to install. Each long, light length has a *flush* coupling attached at one end and a standard 2° male taper at the other end, making installation a simple, one-step operation. And, since the coupling *is* attached, there are no coupling cartons to warehouse or carry to the job.

What's more, with the coupling *flush* to the conduit's outside wall, new CA is easy to stack, store and handle. The flush coupling also eliminates "staggered" joints in the trench. And that means real savings in cutting and tooling time.

Like the hundreds of millions of feet of Orangeburg fibre conduit in use since 1893, new CA has self-sealing joints and impermeable walls. Its smooth, 100% fibre raceway adds years to cable life.

New Orangeburg CA is available in 2", 3", 4", 4½" and 5" sizes. Orangeburg Standard and Nocrete Conduit, with separate sleeve couplings, are available as always. Write Dept. TE-79 for Catalog 52.

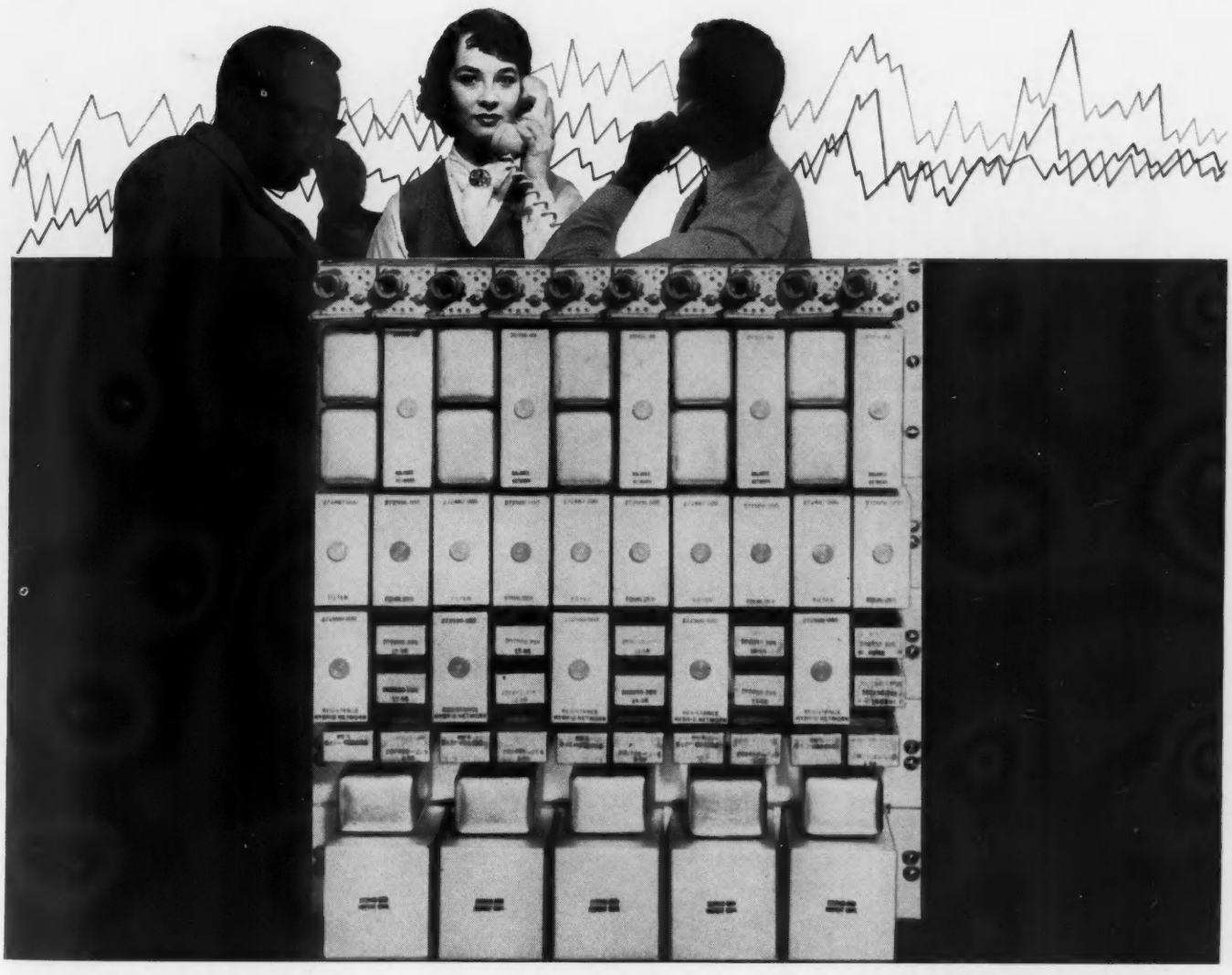
ORANGEBURG MANUFACTURING CO.
Orangeburg, New York • Newark, California
A Division of The Flintkote Company, Manufacturers of America's Broadest Line of Building Products

Orangeburg Fibre Conduit is distributed by Graybar Electric Co. and General Electric Supply Co. with branches and stocks in principal cities.

"551" REPEATERS

Hybrid type

These repeaters for toll and inter-office trunks provide substantial gain beyond the capabilities of other repeaters. Initial cost is low; maintenance is centralized; flexibility is outstanding. Contact your Stromberg-Carlson representative.



STROMBERG-CARLSON A DIVISION OF GENERAL DYNAMICS CORPORATION

ATLANTA: TRinity 5-7467 • CHICAGO: STate 2-4235 • KANSAS CITY: HArrison 1-6618
ROCHESTER: HUbbard 2-2200 • SAN FRANCISCO: OXford 7-3630

S-C STROMBERG-CARLSON | GD GENERAL DYNAMICS

HERE...

Distributed by: AUTOMATIC ELECTRIC SALES CORP., Northlake, Illinois • LEICH SALES CORP., 427 W. Randolph St., Chicago 6, Illino

nothing but the very best will do

eneral Cable erminating Tip able

Your efficient and expensive toll or ex-nge area cables deserve only the very highest quality minating tip cable...to assure your system's efficiency d to make installation faster and easier. General Cable tile Insulated Terminating Tip Cable is designed with t in mind.

solid, fully annealed 22-gauge copper conductors are ted with pure tin to provide easy soldering and a secure nd. The combination of two layers of cellulose acetate d one layer of pure cotton has been found to provide highest grade of insulation for this application. The clear quer over the textile insulation prevents fraying and helps installer do a neat and workmanlike job.

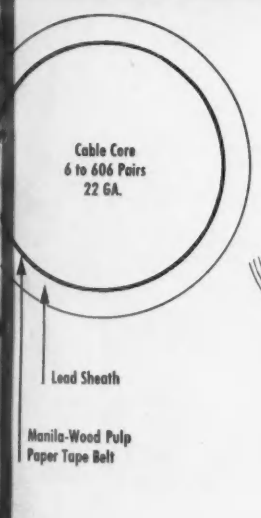
Pairs are laid up with varying lays, to minimize magnetic coupling and crosstalk. 6, 11, 16, 26, 51, 76 and 101-pair cables are of layer construction. Larger pair size cables are of unit construction. The core of each layer type cable is bound with a red-white cotton yarn and the units of unit type cores are each bound with color-coded binder threads, as shown in the diagrams on these pages.

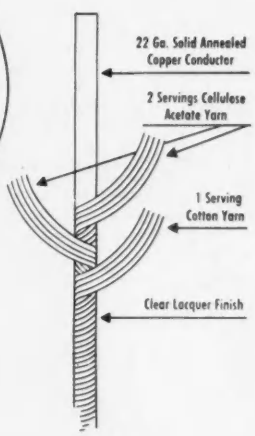
Tracer pairs are provided in accordance with the following:

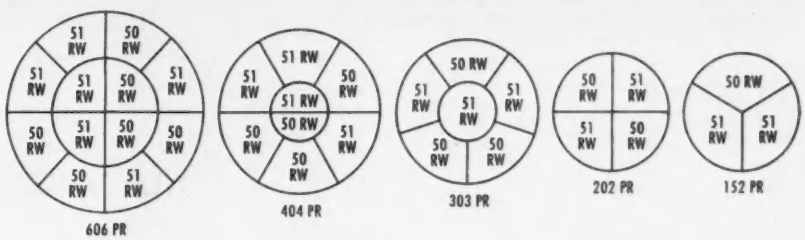
Layer Type Cables — Blue-White tracer in outer layer.
50 pair units — Blue-White tracer in outer layer.
51 pair units — Brown-White tracer in outer layer.

In addition, for 303-404 and 606 pair cables the outer layer of units is bound with white cotton and the inner layer with green and white.

Cable cores are wrapped with a double belt of manila-wood pulp paper to provide high conductor-to-sheath dielectric strength. The assembly is protected by a strong, ductile, reliable lead sheath.







TEXTILE TERMINATING TIP CABLE ELECTRICAL CHARACTERISTICS

Conductor Resistance—96 ohms/mile max. @ 68F

Insulation Resistance—10 megohm-miles min. @ 68F

Dielectric Strength	Maximum Instantaneous
Between Conductors	700 Volts
Between Condrs. & Sheath	1400 Volts

22 GA. TEXTILE TERMINATING TIP CABLE

Pairs*	Approx. O.D.	Approx. net wt. per 1000'
6	0.33"	210
11	0.44"	310
16	0.48"	390
26	0.58"	540
51	0.77"	895
76	0.92"	1190
101	1.05"	1520
152	1.27"	2150
202	1.45"	2760
303	1.77"	3970
404	2.03"	5160
606	2.46"	7480

*All pairs guaranteed

NERAL CABLE CORPORATION, 420 Lexington Avenue, New York 17, N. Y.
Offices and Distributing Centers Coast-to-Coast

for quality and service specify... **GENERAL CABLE**

AE-Lenkurt has everything you need for profitable circuit expansion

Dealing with AE-Lenkurt is mighty good assurance of getting things done *the right way* from start to finish. That's because we offer a complete "package," designed to meet your precise needs.

You deal with experienced *telephone* engineers who understand your problems, and stand ready to relieve you of all planning, engineering and installing details.

Our engineers will give you *impartial* recommendations on the type of equipment that will serve your needs most efficiently and economically for the long pull. That's because we offer a *complete* line of communications equipment, and we have no reason to "push" any one system.

With Lenkurt equipment you can add as you go, the "building-block" way, with full assurance that what you buy today will work with what you buy tomorrow.

In addition, AE can be your headquarters for everything from cable to carrier, from micrometers to microwave—separately or in a completely integrated package.

Want more facts on progressive planning? Then call your Automatic Electric representative, or mail coupon today.

ALL YOUR COMMUNICATIONS NEEDS
FROM ONE DEPENDABLE
SOURCE

Automatic Electric Sales Corporation,
Northlake, Illinois
Attention: Mr. T. B. Collins, Manager

Please send literature on:

- ☐ Lenkurt Carrier
- ☐ Lenkurt Microwave
- ☐ Lenkurt Mobiltel
- ☐ Lenkurt Datatel
- ☐ AE Telephone Equipment and Supplies

Name_____

Title_____

Company_____

Address_____

City_____ Zone____ State_____

In Canada: Automatic Electric Sales (Canada) Ltd.,
185 Bartley Dr., Toronto 16, Ont.

Lenkurt Microwave, for instance–

Lenkurt *microtel* Type 74A is *telephone-engineered* to meet all telephone standards.

With Lenkurt 45BX Carrier, a single 6000-mc unit can accommodate from 4 to 240 channels.

Check these features:

Economical: Power consumption only 250 watts. Uses fewer tubes and operates from office batteries or power line. Automatic frequency control dispenses with need of ovens or blowers.

Efficient: Makes maximum use of available frequency spectrum; has higher power output; requires lower input (system gain 10 times that of most other equipment).

System Expansion: With r-f circulators 2, 3 or 4 terminals can be added to same antenna system, quickly, economically.

Circuit Flexibility: Back-to-back terminal equipment permits dropping and reinserting of channel groups at repeater points.

AUTOMATIC ELECTRIC

Subsidiary of
GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM

LINE LOCK OUT

PBX
by USI

Your subscribers benefit from the numerous advantages furnished as Standard with the USI Type 30 PBX. One of the most versatile is the Line Lockout feature which automatically frees the connecting links for further use after a busy station has been dialed or after an extension user removes his receiver, but fails to dial within 20 to 30 seconds. After this time lapse a busy tone is supplied from the line circuit. Line lockout also automatically goes into effect in case of line trouble.

This exclusive standard feature assures subscribers of greater access and availability with their communications. Equipment with minimum lines can handle a higher volume of traffic. This feature provides peak efficiency with less links during normal working periods as well as during traffic peaks.

Call, wire or write us today for a cost-free analysis of your communication situation. You'll be assured of a prompt, accurate and economical USI solution to your needs. We answer to Charlottesville 3-5153

® USI CORP.

UNITED STATES INSTRUMENT CORP.

POST OFFICE BOX 1191

CHARLOTTESVILLE, VIRGINIA

EDITORIAL

"That Original-Cost Theory"

LIKE MANY TE&M readers we have long contended that the original-cost theory of rate making is entirely deficient during a period of rising costs.

In the past we have expressed that thought in various ways, and on a few occasions we have told the original-cost champions their theory actually produces rate decisions which plainly tell the rate-increase-seeking company "*you can't earn now on what your property is worth but only on what it cost years ago and no allowance will be made for the decreased value of the dollar . . .*"

Mainly, our belief centers around our conviction that use of the original-cost theory of rate making as a method of setting rates during this period of high costs gives no effect to what happens when a telephone company must replace property at costs greatly in excess of the costs of placing the original plant.

We will grant that when price levels remain constant for a long period of time, the original cost concept should not adversely affect a company's ability to finance, expand, improve and properly maintain its property and provide service.

However, a short time with any good book listing the economic facts of the past will prove: (1) the level of prices has been upward since shortly after the day money became the medium of exchange; and (2) that history records very few periods of price decline or stability.

We are glad to note such facts are being brought to the attention of the regulatory commissions.

Only a few weeks ago during hearings of the Michigan Bell Telephone Company's rate application before the Michigan Public Service Commission, Eugene P. Nelson, the company's valuation and depreciation engineer, testified that at the end of March of this year the current value of the company's intrastate investment was $701,736,000, compared with an original cost of $572,087,000.

Looking ahead, Mr. Nelson said he estimated that by June 30, 1959, the figure will have risen to $707,048,000 — both figures considerably higher than the original cost.

"*These figures are evidence of the present and future value of the company's plant, because they recognize the change in the purchasing power of the dollar as it applies to Michigan Bell's investment,*" said Mr. Nelson. "*Original cost cannot represent the value of the property in terms of today's dollars, because it is made up of numerical dollars added to the company's books over the years without regard to their changing purchasing power . . .*"

At the same hearing another witness, Father William T. Hogan, professor of economics at Fordham University, noted that the purchasing power of the dollar in 1958 was 50 per cent below that of 1939 and said "*industry generally has not charged off adequate depreciation on its facilities.*"

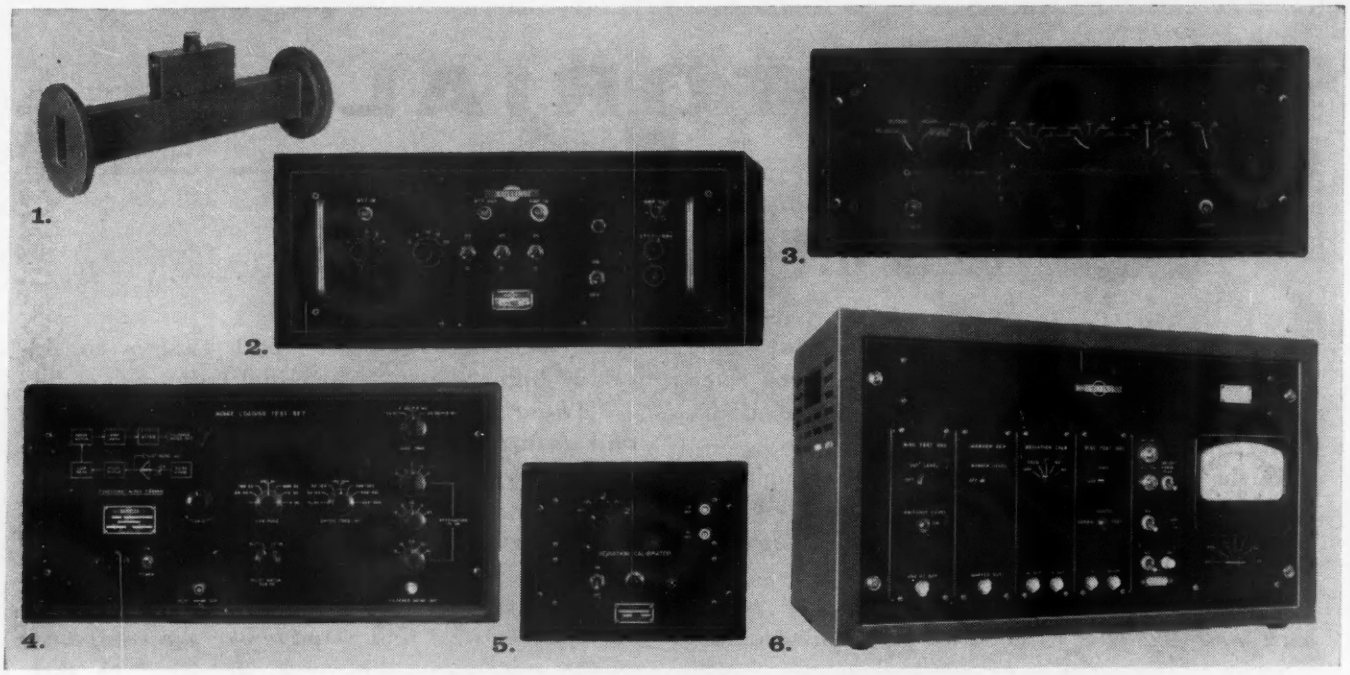
"*It takes over two and one-half dollars today to build what one dollar would build in* 1939 *and* 1940," he said. "*Generally speaking, equipment installed in* 1939 *at a cost of one million dollars could not be replaced today for less than two and one-half million, yet the depreciation funds set aside for this replacement amount only to the original cost or one million dollars. Thus an additional one and one-half million dollars is needed.*"

Another witness, Dr. Walter A. Morton, professor of economics at the University of Wisconsin, stated "*a fair rate of return must be based on the value of* 1959 *dollars and not those of another vintage*" and emphasized that in "*utility rate making, inflation has to be recognized . . .*"

These statements deserve circulation beyond the boundaries of the good state of Michigan to the commissions of states now using the original-cost method for computing the rate base of a public utility.

We believe they should be circulated and recirculated until all regulatory commissions recognize that the original-cost theory is entirely deficient as a method of setting rates during today's period of high costs.

(The foregoing editorial, although copyrighted, may be reprinted in whole or in part without charge provided credit is given this publication, four copies of such reproduction are filed with this publication, and publisher is advised of number of reprints made. This legend need not appear on the publication.)



COLLINS MICROWAVE TEST EQUIPMENT

FOR ACCURACY AND DEPENDABILITY

Maintain maximum microwave system performance with Collins precision-engineered Test Equipment. Collins equipment provides sensitive, accurate test service you can depend upon. Efficiently tests all Collins Microwave Systems, as well as most microwave equipment of other manufacturers.

1. 173R-1 Fade Simulator – is a waveguide attenuator for general purpose use with 6 kmc system. May be permanently installed at microwave terminals and repeaters to quickly check receiver sensitivity and fade margin. A preset value of attenuation, between 10 to 30 db can be inserted into the waveguide by pushing a button.

2. 476B-1 Signal-to-Noise Test Set . . . is a sensitive, highly selective single frequency receiver with 3KC bandwidth centered on 455KC. It is employed to simulate a carrier channel and is useful in making microwave system S/N tests between stations where no carrier drops are available for test.

An AC-VTVM is required in addition to the 476B-1 for such tests. The 476B-1 may also be employed with the 476C-1 or 477C-1 noise loading test set for making noise loaded intermodulation tests.

3. 476C-1 Noise Loading Test Set– Provides a noise test signal when making system intermodulation tests. This set is a simplified version of the 477C-1. It includes a noise source, amplifier, 308 kc pilot notch filter, 455 kc noise window notch, 20 kc high pass filter and low pass filters to simulate loading of 120 and 240 channels. This test set is to be used with the 476B-1 Signal-To-Noise Set.

477C-1 Noise Loading Test Set– Provides a noise test signal when making system intermodulation tests. The nominal 3 volt rms random noise output simulates a composite signal from a multichannel carrier system. Intermodulation noise which falls within a selected noise window notch gives an indication of the system intermodulation characteristics. A Zener diode is employed as a noise generator. Included are six noise notches, six low pass filters (used for channel loading), two high pass filters, a 308 kc pilot notch, and a calibrated attenuator. Noise notches at 48, 98, 198, 314, 455 and 555 KC. Channel Loading — Low Pass Filters: 20KC, 100KC, 250KC, 600KC, 2 Mc and 5 Mc.

5. 477Z-1 Deviation Calibrator – For field calibration of microwave receivers and adjustment of microwave system deviation, and bench testing IF Amplifiers. The Deviation Calibrator supplies a 60 mc carrier of known deviation. The 477Z-2 Deviation Calibrator supplies a 70 mc carrier for servicing receivers employing 70 mc IF Amplifiers.

6. 478Z-1 IF Amplifier Test Set – Services 60 mc amplifiers. The 478Z-2 services 70 mc amplifiers. 478Z-1-2 IF Amplifier Test Sets contain five subassemblies: **1. Power Supply** — Furnishes filament and plate voltages for test set subassemblies and the IF amplifier being serviced. **2. 250 kc Oscillator** — Supplies a 250 kc signal with 0 to 15 per cent square wave amplitude modulation. This signal is used for IF amplifier linearity adjustments and for frequency modulating a fixed oscillator in the sweep generator. **3. Marker Generator** — In the 478Z-1, supplies 55, 60 and 65 mc reference marks for positive identification of these frequencies when using the sweep generator. In the 478Z-2, supplies 65, 70 and 75 mc markers. **4. Deviation Calibrator** — In the 478Z-1, supplies a 60 mc carrier of known deviation (±3 mc) for calibrating the IF amplifiers. In the 478Z-2 a 70 mc carrier is supplied. The test signal is derived from harmonics of a crystal-controlled oscillator; hence, deviation is fixed at a known value. **5. Discriminator Test Receiver** — is used in conjunction with the 250 KC oscillator and external sweep generator and oscilloscope to plot the linearity of the IF discriminator characteristics. The first derivative (or slope) of the discriminator characteristic is presented. An internal calibration signal is provided to allow reading linearity from the oscilloscope in per cent.

The 478Z is designed for production testing of IF amplifiers. It is used in conjunction with an oscilloscope and sweep generator to provide rapid tests of bandpass response, linearity, and deviation calibration. Supply voltages for the IF under test is also supplied by the test set.

To assure the highest possible performance and the finest microwave test equipment available, specify Collins.

For complete information about Collins Test Equipment, call or write Collins Radio Company, Texas Division Sales, 1930 Hi-Line Drive, Dallas 7, Texas.

COLLINS

COLLINS RADIO COMPANY

DALLAS • CEDAR RAPIDS • BURBANK

by F. E. NORRIS*

Why Leave The Future To Chance?

When an objective is set the framers of the plan must identify the extraordinary problems and the actions that must be taken. Generally these problems and actions will concern new thoughts — even though they may relate to the most commonplace plant items or work functions. (Concluded from the June 15 issue of TE&M.)

Planning In The Operating Companies

WHILE THIS entire memorandum was prepared for use by the operating companies, a few direct words under such a heading may be useful.

The System Basic Plan which has been sent to the companies will serve as something of a pattern for the operating companies. Yet there are "blocks" and problems peculiar to them that are not hinted at in the System Plan and which merit a few words of illustration.

First and foremost, it might be wise for the operating companies to start by preparing a Master Plan. The logic of this is that so many other things are dependent upon such a Plan. Included in such a Master Plan would be a long-range, company-wide Station Forecast which would replace the one made in New York for each company.

When an objective is set the question is: What must be done for its achievement? There obviously would be no point in the framers of the plan reciting all the *ordinary* things that must be done to reach the objective. Instead, to identify the extraordinary problems and actions that must be taken is where the effort should be directed. This may lead to the need for policy decisions and separate plans to reach the objective. Generally, these problems and actions will concern *new* thoughts — even though they may relate to the most commonplace plant items or work functions — in other words, to new arrangements of old components.

The following will further illustrate these generalizations.

Rate Revisions

WHAT IS or is not *new* may be debated but to illustrate what is meant let us assume that the following is accurate and is new. During the last quarter century, our rates have undergone repeated revision. While it might be quite inaccurate to say the revisions were haphazardly made, at the same time there was no clear or formal or definite objective toward which the series of revisions was directed — at least no such aims are known to the author.

Revisions have been made under pressure and under the need to improve earnings without delay. Principles yielded to expediency. What the commission and its staff believed proper was controlling in most instances. This is understandable but might not excuse our failure

Mr. Norris is Vice President-Planning & Development of the General Telephone System.

to know from our own analyses and studies what we as a company believed was right and what we should, over the long term, work toward as revisions are made.

To illustrate then the character of a "plan" in an operating company, questions such as the following might be asked and, of course, subsequently answered:

Bearing in mind that in one way or another our revenue requirements will be met, is it in the interest of the realization of our full potential development that we aim toward decreasing our service connection charges in relation to basic rates?

Assuming our aim is to upgrade residence service to main line service what rate differentials between main line and party line rates shall we work toward and what concomitant sales policy should apply?

Shall we work toward "package" residence rates for long-range business stability reasons and if so, what treatment shall apply with respect to customer currently with sum-of-the-part rates?

These are illustrative. Except for the last, they are ordinary questions asked many times but which may not, and probably do not, have a "company" answer. There are, of course, many other similar and perhaps more complex questions pertaining to rates and tariffs but this illustrates the point that getting answers *that haven't been gotten before* and as a guide to the future, may in a real sense be "new" and justify long-range planning treatment.

In setting down what you would like to do about these matters — and why you'd like to do it — it naturally is recognized that a company cannot change its tariffs unilaterally nor without a proper showing. Therefore, many years may pass before an aim such as this is substantially achieved. But this fact does not lessen the importance of knowing what is desired and aiming all actions through the years toward the objective.

Main Line Service Policy

SYSTEM presidents agreed it should be an objective of the operating companies to upgrade party to main line service in the base rate areas. As the objective in this case is decided and the know-how is commonplace, any plan that might be required will stem from fundamentally different causes than the "new idea" philosophy discussed a moment ago.

In the "main line" policy case, the underlying justification for a long-range plan arises from these apparent facts:

a. Much capital will be required to effect this policy.

b. The main line versus party line rate differentials from a net income standpoint should be carefully considered before wholesale upgrading is undertaken.

c. Care must be exercised to be assured that the time lag between raising capital and making it productive does not unduly dilute earnings because of introducing into the plant large amounts too quickly.

A program of this type has all of the ingredients for becoming sidetracked. It is easy for one to get out of balance from the standpoint of overacceleration. And overacceleration would result in the corresponding reaction of stopping the program altogether.

It is these procedural considerations which justify a long-range plan with the program of setting forth *how* the upgrading will be undertaken and *how* the results will be measured on the time scale.

This points up a difficulty frequently encountered: the problem of translating broad, general policy into practical working arrangements. The accomplishment of such an arrangement requires a movement away from such broad instructions as "provide for 100% main line facilities on future cable placements" etc. In other words, guide lines of *thought* replace exact formula and routine.

A plan of this kind which tends away from *demands* and toward created desires requires close interdepartmental coordination in order to be assured that plant for such "upgrading" as fiscal limitations permit is constructed at the proper location and that upgrade sales and installations follow construction with minimum delay.

Extraordinary Interdepartmental Problems

GENERALLY, we do not think of a long-range plan as a tool for problem solving. There may, however, be exceptions where it can be so used. Or perhaps, in achieving a long-range plan a current problem is incidentally solved. Such a situation may concern a current organizational shortcoming which, for good reason, should not be immediately or directly corrected. On the other hand, the company concerned may expect substantial growth and want to establish an objective organizational structure toward which all future appointments and changes will be made. By this move the hope would be that no serious disruptions will occur as the organization is periodically adjusted to its new size. During such planned adjustments, a solution to the current problem probably will more or less naturally occur.

Area Susceptible To Confusion

A DISCUSSION made with the hope of clarifying the meaning of "Advance Planning" was given at the outset. Even so, confusion seems to occur as between the meaning of the following: budgets; short-range plans; long-range plans; and blue-sky plans.

Such confusion as may exist in this area seems to stem from the experience (or lack thereof) of the individual or company in these planning categories. In the case of the General Telephone System we can dismiss a discussion of budgets — the one year, three year and five year — because they have so long been a tool that they are well understood.

The definition of short-range plans which seems best to fit our situation is that they are segments of a long-range plan — or a series of implementing plans of a long-range plan.

Long-range plans need not be further discussed here as they are what this entire memorandum is about.

Thus, we come to blue-sky plans. It is to draw a distinction between long-range and blue-sky that merits this section.

Both long-range and blue-sky have one thing in common — they both anticipate a number of years for realization.

Long-range plans lie largely, at least in telephone companies, in the applied arts field. This is to say that our long-range plans concern company and national economies, the use of materials and apparatus, etc., with which we are familiar or with which, based upon what we know, we are sure a predetermined result can be realized. In other words, subject to the accuracy of our judgment and assumptions, we know we can realize the objective of a long-range plan as hereinbefore defined.

Blue-sky planning, on the other hand, relates more to the unknown — the type of idea that requires research and development before it can be a reality. It is more like "dream stuff" than the tangible things one can plan and build on with confidence.

Operating telephone companies generally must depend on someone else to carry out their blue-sky thinking. Consequently, a long-range plan that depends upon an "outsider" to see the merit of and to carry out a gratuitous idea becomes of doubtful, if not of completely uncertain, value. Thus, the benefits of blue-sky planning, as far as our operating industry is concerned, are more in the realm of technological than in administrative advance — and Advance Planning is basically an administrative tool.

What Kind Of A Fellow Is A Planner?

WHAT ARE HIS qualifications? Where does he fit into the organization? What authority does he have? What organization is under him? For industry in general, that is, nonutility companies, the answer to these questions are "all over the lot." In some companies the president or a high-ranking vice president has the responsibility for planning with no organization under him for this purpose. In other cases, there will be an organization. In still other companies, the responsibility for planning lies with an up-and-coming young executive who might have a rather large organization under him — up to 20 or 25 people — some of whom are statisticians and economists.

In many companies (again, nonutility) the planning function is what the ordinary budgetary and, in some cases, the engineering function is to our System. With these considerations in mind, it obviously would be unwise to pattern our planning function on that of non-System companies.

Thus, the question is: What might the planning function be like in our operating telephone companies? Any attempt to give a categorical answer at this juncture would be unwise. There are, however, these important considerations to guide our thinking:

1. Any comparison between one company and another which falls short of a complete organizational and work flow etc., analysis might be misleading.
2. Most of the basic planning in our System will center in the Service Corporation though not exclusively in the Planning Department. There is, however, an area, of planning, as the term is used herein, which can only be and should be undertaken in the operating companies.
3. The success of the planning function does not depend so much on technical competence as upon *imagination* tempered by sound business judgment.
4. The "planner" should not be in a department which is responsible for the execution of the productive work set forth or implied in the Plan.
5. The "planner" should be so situated in the organization that any "blocks" placed in his way can be removed either by him directly or by top executive action to which he has access.
6. Because the planning function in effect carries out a direct or implied executive responsibility or desire, the planner must have perspective and competence in over-all company administration, including an insight into financial aims and structures.
7. Care will have to be exercised to avoid the serious error of overlapping authority and responsibility, an inherent pitfall in an assignment of as broad a scope as planning.

For concrete thought consider this: the formalized

The Author, F. E. NORRIS, is vice president-planning & development, General Telephone System.

planning function is new in our System — not yet having been established in the operating companies — not, at least, as far as New York proposals are concerned. It probably should be so established to some extent. Additionally, upon considering it is easier to upgrade than downgrade a position, the planning function might at least initially be placed in an existing department either by the department head "doubling" in brass or by his assignment of an assistant who should be the "planner."

In view of these "considerations," it would seem that the department best suited to head up this function at least until it might be decided to make planning a separate function, would be the Marketing Department.

Regulation and Risks

WE HAVE talked before about changing our philosophy from one which substantially waits for our customers to make service "demands" of us to one where the company takes the initiative, learns what the customer wants and acts to satisfy those "wants."

It must be apparent that doing business according to this new philosophy introduces some new risks which did not exist before. Let us explore some of them.

First is the risk of making mistakes in interpreting what the customer wants. Surveys, field tests and trials naturally will be made to minimize such mistakes. These "tests and trials" even though undertaken, however, do not remove all chance for error because of the large number of our customers and their wide geographical dispersement. Overly extensive tests and trials, on the other hand, could be self-defeating by the large costs they would create and the very real factor that the customer may change his mind about what he wants. A case in point would be the color shades desired today as against those desired tomorrow.

Another factor in this area concerns the effect of technological progress. A project, for example, for a customer product may be ready to come out of R & D when knowledge of new techniques or inventions which promise improvement come to mind. The question is, shall we encourage production of the current project or cancel it and start over with a new one, employing the "new techniques or inventions?" Here, again, the desire to satisfy the customer introduces a new kind of cost because the "ready-to-go" project is for all practical purposes obsolete before it goes into production. The alternative would be delays which might be undesirable though unavoidable delays which might be difficult for the uninitiated to understand.

This "new" kind of cost may of course be nothing more than a depreciation expense item. To this extent the risk will depend upon whether it is provided for in the depreciation rates and, in turn, covered by service charges.

There are other kinds of risks but perhaps the greatest arises from the change of income mix as we swing away from a business largely confined to rendering a basic, essential service to one where basic service becomes a smaller component — one replaced with a much greater percentage of "fringe" items such as extension telephones. While we should endeavor to develop rates which recognize this change in character and which tend to stabilize revenues in time of recession, still the risk is greater.

This is a vitally important area of thought as in it lies a basis for a *higher rate of return* than might otherwise be justified. The effects of our long-range program must, therefore, be carefully analyzed and understood so that the Regulators can, at all times, be appropriately informed.

Summary

The following concisely summarizes at what this memorandum is aiming:

1. "Planning" means something now that it didn't mean before in terms of the administration of our business.

2. Our industry, including our System, is underdeveloped now and must catch up with the economy.

3. We should measure progress by our position in the economy instead of by stations gained.

4. To maintain our position in the future we must: (a) Satisfy customer wants and desires; (b) give a continuously improved service; (c) recognize the additional risks incurred; and (d) maintain at all times a proper profit margin — one that permits the vigorous prosecution of Advance Planning.

(5) We also must look ahead, determine the markets available to us, decide upon the portion thereof which we can economically develop and lay plans to see that what we decide to do is done.

(6) A "plan" is generally considered to involve three principles: (a) An objective; (b) a program; and (c) a means of checking progress.

Also a plan:

. . is considered a formalized document.

. . generally proceeds with executive blessing if not inspiration.

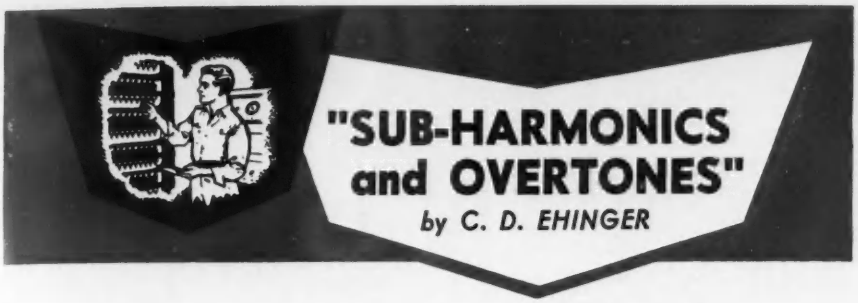
. . is prepared as to its aims with assistance of executive-appointed committee, when desirable.

. . contemplates periodic reports of progress and explanations of acceleration or deceleration as compared to expectancy.

. . is subject to revision.

(7) The underlying purpose of this memorandum is to lay a foundation upon which the operating companies may do "planning" of their own.—*F. E. Norris.*

EDITOR'S NOTE: — Thanks to the many TE&M readers who have "thanked" us for publishing Mr. Norris's article on planning. Mr. Norris will soon retire from his duties as vice president-planning & development, General Telephone System. Why not drop him a personal "Thank You" note? The address is 260 *Madison Ave., New York* 16, *N. Y.*



"The Fletcher-Munson Effect"

EVERY MINUTE of each working day, it is the human ear toward which we are working and which provides the final link in our business of transporting intelligence from one point to another by audible sounds . . . "

IT IS possible for any one of us to spend a lifetime in the telephone industry, either directly or in its various branches, and not once during that lifetime give a single thought to the final and ultimate object of all the work, planning, and expenditure of billions of dollars.

This final and ultimate objective to which I refer is, of course, the human ear — that marvelous mechanism which is the instrument of one of our five senses.

Perhaps I am wrong when I blandly make the above statements — perhaps the great majority of telephone industry members realize, during every waking minute of each working day, that it is the human ear toward which we are working and which provides the final link in our business of transporting intelligence from one point to another by audible sounds.

In any event, when I finally realized how rarely I ever pay any attention to this marvelous instrument and decided to do a little research, the results have seemed to indicate to me that the greatest sources of information as to the manner and methods by which our ears actually function have been supplied by researchers in the telephone industry rather than in the medical field.

Mentioning the medical field causes me to get off the subject, for just a moment, to bring up a point which may be a source of some amusement to both of us.

Years ago, in a college psychology course, I was introduced to the power of suggestion. The course in psychology was held on the second floor of a rather rickety old campus building and it was necessary to ascend and descend a flight of stairs each time I attended the course.

The Author, C. D. EHINGER is president of Citizens Tel. Co., Decatur, Ind.

One day, the psychology professor notified the entire class that, from that point on and for a period of two weeks, each one of us in the class would mentally count the treads on the stairway as we went down the steps. He further pointed out this was not a requirement, that he was only suggesting this to us but that, due to the suggestion, it would be impossible for us not to mentally count the steps, and remember his admonition each time we descended.

To further demonstrate the point, I am suggesting to you that, for the next period of two weeks from the time you read this article, whenever you talk to a person face-to-face, you will be acutely conscious of his or her ears and will remember that those are the ultimate objectives of those of us in the telephone industry. You will not forget this suggestion!

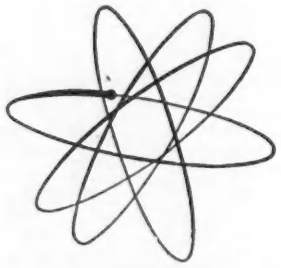
Returning to the ear itself, researchers have arbitrarily classified the ear as being divided into three parts, namely external, middle, and internal. That part normally visible at either side of the head is termed the "pinna" and seems to come in a variety of sizes and shapes: some seem to be close to the head, others stick out in the breeze like a sail on an old-time windjammer.

The purpose of this part of the ear is to collect a volume of air which has been set in motion by sound, and transmit this air into the auditory canal. At the end of the auditory canal is a membrane which is called the eardrum and is the beginning of the middle ear. This membrane is set in motion, in rhythm with the air striking it, and transmits this motion to a mechanical system of three bones in the middle ear. These three bones present a lever system and are termed the hammer, anvil, and stirrup.

At the end of the third bone, called the stirrup, is a much smaller membrane termed the "oval window" and it marks the entrance into the inner ear. The lever action of the three bones presents a large mechanical advantage and this lever action, coupled with the relative size of the two membranes, causes the pressure to be exerted upon the inner ear to be thirty to sixty times as great as the pressure caused by the outer air striking the eardrum.

Inside the inner ear is a snail-shaped cavity filled with a fluid which transmits the vibrations received from the oval window to the brain, over a network of thousands of nerve fibers. Although there is still some confusion as to the exact means of this final transmission, it is generally believed that the final impulses are actually electrical in

TELEPHONE ENGINEER & MANAGEMENT'S Electronics



NOTE BOOK

By LEO G. SANDS

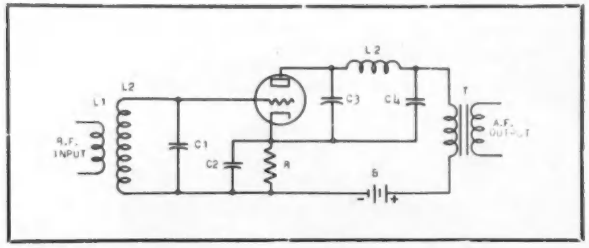
Prepared for
Educational Division
TELEPHONE ENGINEER & MANAGEMENT
7720 Sheridan, Chicago 26,
Copyright 1959

TELEPHONE ENGINEER & MANAGEMENT's
ELECTRONICS NOTEBOOK

By LEO G. SANDS

3.2-14 POWER OR PLATE DETECTOR

A popular form of detector is shown here. The grid is biased almost to cut-off by R across which a voltage is developed if any current at all flows through the tube. This voltage becomes higher, of



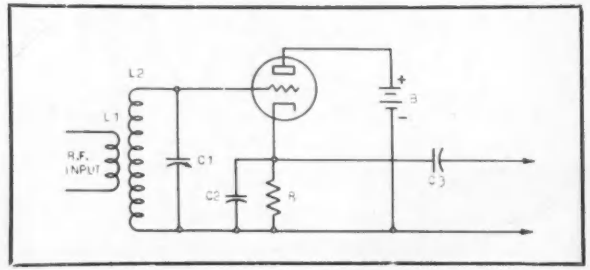
course, as plate current increases. By-pass capacitor C_2 prevents the signal from developing across R_1. Because of the nonlinearity of this circuit, rectifier action is achieved . . . The negative half-cycles of the RF signal are sheared off and only the positive half-cycles and the audio modulation remain in the output. Low-pass filter C_3, C_4 and L_3 passes the modulation but removes any remaining RF component.

3.2-15 INFINITE IMPEDANCE DETECTOR

In the grid leak detector, the diode shunting effect of the tube acts as a resistor across the tuned input circuit which reduces its "Q" and hence reduces its selectivity. In the infinite impedance circuit, the grid does not draw current and the tube looks like

TELEPHONE ENGINEER & MANAGEMENT's
ELECTRONICS NOTEBOOK

By LEO G. SANDS



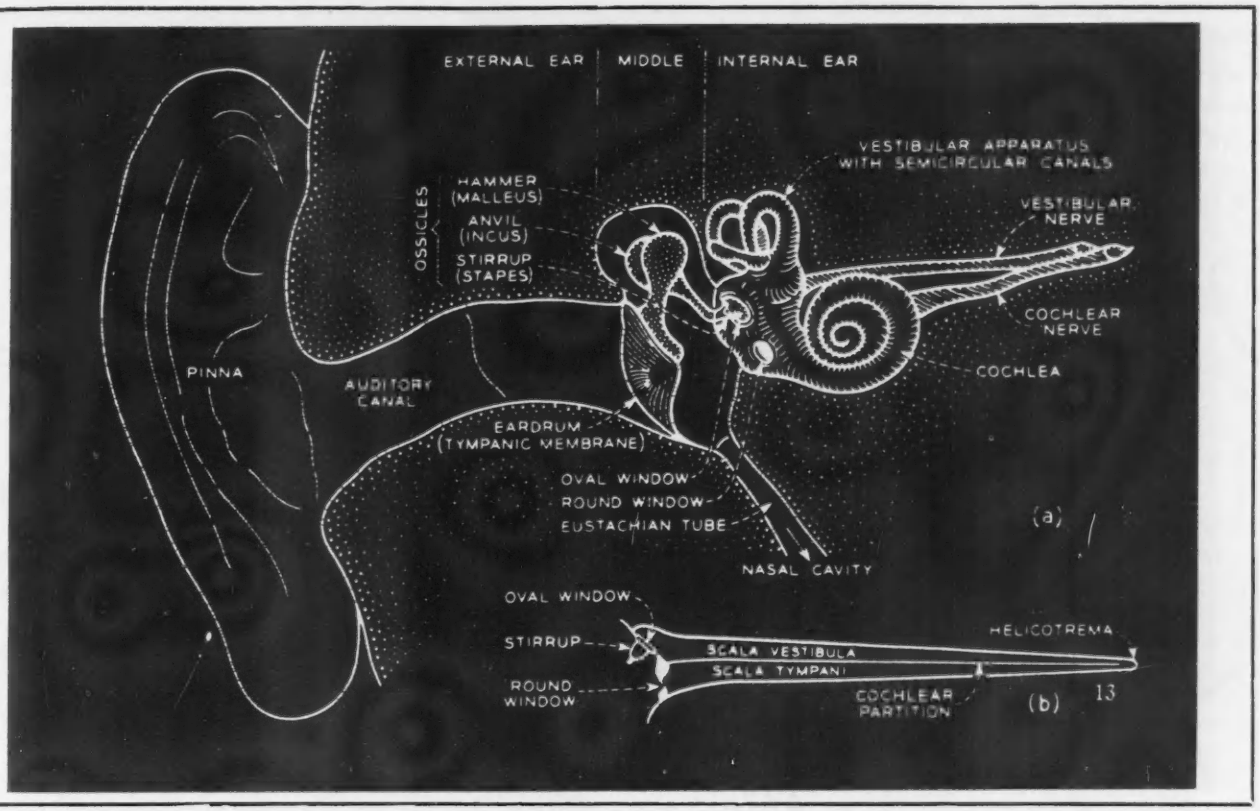
a very high impedance. Instead of taking the signal from the plate, the output is derived across the cathode resistor R_1. The tube is thus used as a cathode follower, but when R_1 is of a high value, the tube is biased almost to cut-off and is therefore nonlinear and functions as a detector. C_2 is of small value since it is supposed to by-pass RF only and to have but little effect on the desired audio signal. Capacitor C_3 prevents the output from upsetting the bias voltage across R_1 since it blocks d-c.

3.2-16 REGENERATION

While a tube provides amplification of 20 times or much more, it can provide much, much more amplification. When the grid is driven more positive during the positive half-cycle of the input signal, the plate becomes more negative because of the 180° phase reversal in the tube, and vice versa. If a coil (L_3) is placed in series with the plate and is placed close to the grid coil L_2 and oriented so that it feeds a signal into the grid coil which is in

More Data For Your "Electronics Notebook" on Page 47.

More Data For Your "Electronics Notebook" on Page 47.



Here are the intricacies that make hearing possible. Sound pressure waves striking eardrum are magnified 30 to 60 times by small bone levers which pass impulses to fluid of inner ear, and by nerves to brain.

nature and that the brain is receiving electrical stimuli.

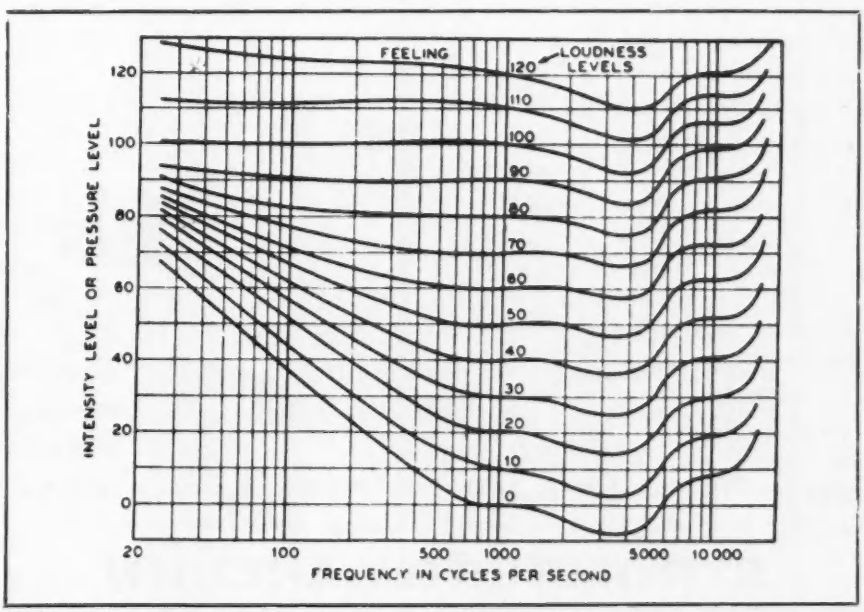
Due to the reactance of the fluid and the fact that the three bones are mechanical in nature, the ear has definite limitations as to its frequency response. In addition, the three small bones acting upon the large membrane and the small membrane are actually an impedance matching transformer, matching the low impedance of outer air to the high impedance of the inner ear fluid.

There are certain sounds which are too low in intensity for us to hear without the aid of some type of outside or artificial aid. Such sounds are termed as being below the "threshold of audibility." Other sounds can become so intense that they actually cause pain, and are termed as being above the "threshold of feeling." In between these two thresholds, we can hear sounds of varying frequency and intensity.

One of the most interesting bits of research in connection with intensity of sound was performed by Fletcher and Munson and the results of their research appear in a Bell System Monograph B-756. The interesting point concerning this research, and one which has come to be known as the "Fletcher-Munson Effect," is that as sound intensity is reduced our ability to hear sounds at the low end and the high end of the audible range becomes less acute.

I imagine we have all had the experience of turning down the volume level on a radio or record player and noticing we no longer hear the bass or the treble sounds which we heard before, or, conversely, turning up the volume level and suddenly becoming aware of a booming bass or good treble sound.

Actually, the radio or record player was probably reproducing bass and treble at the lower volumes, but it was our ear that was failing to re-



Variations in the frequency response of the human ear with sound intensity.

It's a good wind tha

Here's a forecast you can count on: It's always fair weather when you buy construction materials and supplies from Stromberg-Carlson.

We have strategic "good weather stations" spotted around the country, and there's one near you. No high-pressure system can develop with our "meteorologists" on the job—just quality supplies from reputable makers, and personalized service from experts.

We ar
and happ
requirem
of fair b

STROMBERG-CARLSON A DIVISION OF GENERAL DYNAMICS CORPORATION

ATLANTA: TRinity 5-7467 • **CHICAGO:** STate 2-4235 • **KANSAS CITY:** HArrison 1-6618 • **ROCHESTER:** HUbbard 2-2200 • **SAN FRANCISCO:** OXford 7-3630

S-C | G

d that blows good!

We are always glad to serve your smallest need and happy to keep a weather eye out for your future requirements. So stay with the XY® front and be sure of fair breezes and cloudless skies!

S-C | GD

Gerald Gaydos is one of our barometer watchers at our Chicago "good weather station."

produce them. On the newer high-fidelity sets, a "loudness" control is used which electrically counterbalances this peculiarity of the ear by electrically "boosting" the base or treble as the volume is reduced.

We can notice this same effect in our telephone conversations when we talk to a person at a normal level and then engage the same person in a conversation with the level heavily attenuated. Invariably, the sound will be described as "tinny", which is caused by the fact that our ears do not hear the bass sounds that are still present but have been presented at a reduced intensity.

SUBMIT YOUR PROBLEMS

You are invited . . . to tell our authors about problems on which you'd like to have an opinion.

While we don't claim to have all the answers, we'll welcome the opportunity to discuss as many as possible in TE&M's regular departmental columns . . . and that could be helpful to you and others with the same (or equal) problem.

Another oddity about the human ear is the fact that our ability to distinguish intelligence is severely impaired by relative noise levels. Yet, contrasting to this usual procedure, nearly every mother can distinguish the cry of her own child in the midst of hundreds of other youngsters creating a bedlam. Another example is that any wire chief can tell you that he can sit, day after day, in the middle of an equipment room sounding like a cross between a beehive and a boiler factory, and yet be able to distinguish the sound when one particular switch is in trouble and creates an un-normal sound.

There are hundreds of other oddities about the human ear, such as the fact that youngsters of five years of age can distinguish sounds up to and slightly above 20,000 cycles per second, and that this ability gradually tapers off as we age until, at the age of approximately 55, we cannot distinguish sounds above the 8,000 to 10,000 cycle range.

But, regardless of the oddities and

THE
CANOPY BOOTH*

INSPIRED STYLING PRODUCES THE FORWARD LOOK NEEDED TO ENHANCE THE TELEPHONE BOOTH'S APPEARANCE.

The dramatic, newly styled "see-it-all" Canopy Booth was efficiently planned to meet the trend of modern telephone service.

TELEPHONE
PHONE
There is no other full size booth more economical — initially, nor in the long run—that has such lasting beauty, that will give years of good, hard service.

GP-2600 List 1
"The Quality Booth of the Forward Look"
ECONOMICAL — PRIVATE — DURABLE
For details Phone or write

GLADWIN PLASTICS, INC.
165 COURTLAND ST., N.E. ATLANTA 3, GA.
JACKSON 5-5384

the capabilities of the human ear, it still remains the prime objective of all of us in the telephone business, and remains as one of the prime sources of awe which we should all feel when we consider that God, in His wisdom, has chosen to give us this wonderful gift.

Don't forget your main thought in your conversations with people in the next two weeks!—*C. D. Ehinger.*

References: *"Electrical Communication," Albert*, 1940, *Chapter Three; and "Hi-Fi Manual," Fawcett Book* 232, *2nd printing*, 1955, *Chapter Two.*

—73—

Any comments, criticisms, or suggested subjects as a future topic? Address all correspondence to "Sub-Harmonics and Overtones", "Telephone Engineer & Management," 7720 Sheridan Road, Chicago 26, Ill.

Alpeth Cable Brochure

THE TELEPHONE & Control Cable Div. of Rex Corp. has announced the availability of a technical booklet on Alpeth (aluminum and polyethylene) plastic telephone cable for use in aerial, duct and direct burial service.

Brochure discusses the application, construction and electrical characteristics of Alpeth cable and contains tabular data on exchange area cable (aluminum and copper shield), insulation and binder coding. It also visually presents cable construction for from under 25 to 400 pairs of cables.

For your copy write to *Rex Corp., Tel. & Control Cable Div., Dept. TE&M, West Acton, Mass.*

Microwave Ferrites

GENERAL Ceramics Corp. has announced publication of a new bulletin on microwave ferrites. The brochure is illustrated with graphs showing magnetic and dielectric properties vs. frequency, magnetic induction vs. temperature, and hysteresis loops. Information on typical applications is also provided. Available from *General Ceramics Corp., Dept. TE&M, Keasley, N. J.* Ask for Bulletin No. 259.

COMMERCIAL DEPARTMENT NOTES

by ALLAN R. STACEY

"Four Steps To Sales"

"IF WE ARE to successfully present our services to a customer, we must — (1) think like the customer, (2) add the human element, (3) follow a recognized plan, and (4) use a service presentation that can be adapted to the basic individuality of each customer."

MOST OF our companies have grown so rapidly since World War II days and provided so much more service because of the telephone scarcity that came out of the war that sometimes we just sit back and let the public come to us. You can develop a really interesting discussion in any small group of telephone people by dropping the question, "Are today's business office personnel 'order takers' or 'service representatives?' " I believe our job is that of recommending the best service to a customer and convincing him that what we have offered him is just what he needs.

If this, then is our objective, how do we train our service representatives to do it? One way is through the use of such tools as training films. One of the best I know is entitled, "Four Steps to Sales." (Upon request we'll be happy to tell you how to obtain use of it and a set of teaching instructions to make it most effective.) This film teaches that if we are to present our service successfully, we must do these things:

(1) *Think like the customer.*
(2) *Add the human element.*
(3) *Follow a recognized plan (see our column in the June 15th issue of "Telephone Engineer & Management").*
(4) *Use the "Four Steps to Sales."*

Thinking Like The Customer

WHY IS IT important to adjust our thinking to the customer we are talking to? It brings a more human element into our service representative-customer contact. We begin to talk in the terms that he will understand rather than in our own trade jargon. We develop a rapport with him which permits us more easily to discover what the three major telephone areas of his home are — living, working and sleeping. We make him feel that the telephone company has personality rather than being metal switches and concrete buildings. By learning to think as the customer is thinking we teach ourselves to understand why he does not immediately accept recommendations that we make or why he believes a black centrally located telephone will supply all his communication needs.

The author, ALLAN R. STACEY, is vice-president of the Sunland-Tujunga Tel. Co., Sunland, Calif.

Does putting yourself in the customers' place mean deciding how much the customer can afford to pay for service? It may, but this is answered with another question, "Who is the only one who can make the final decision on what the customer will buy — the customer himself."

Our responsibility is to recommend the best possible telephone service and then let him decide how much he can afford to buy. In terms of comparative cost, telephone service is the greatest bargain available today. What other utility service provides all of the maintenance on the equipment at the subscriber's premise? What other utility pays for the lines running into the house and makes the capital investment in the terminating instrument? The gas company connects to *your* pipe at *your* stove. The electric company connects to *your* house wiring and *your* electric laundry machine. We, in the telephone business, need not be reluctant to ask the public to pay for the quality of service that is being provided. But enough of this and on to the four steps.

The Four Steps To Sales

IN "FOUR STEPS TO SALES" we have a "service presentation plan" that can be adapted to the basic individuality of each customer we talk to. Here are the steps in order:

(1) *Get the facts.*
(2) *Make the recommendation.*
(3) *Answer objections.*
(4) *Close the service sale.*

In this issue we'll discuss Step One and Step Two. In a subsequent issue we'll cover Step Three and Step Four.

Some Helpful Facts

DURING the course of the conversation the service representative will want to learn most of the following facts. She does this on the basis of information that is volunteered or by direct questioning or by impression. She learns:

(1) *Number of rooms and what kind they are.*
(2) *Number of floors.*
(3) *Members of the family who use the service.*

Standing, Mr. Tony Osterkamp of Santa Ana, Calif.

What do these men have in common?

They're all successful farmers.

They all use extension phones to run their farms.

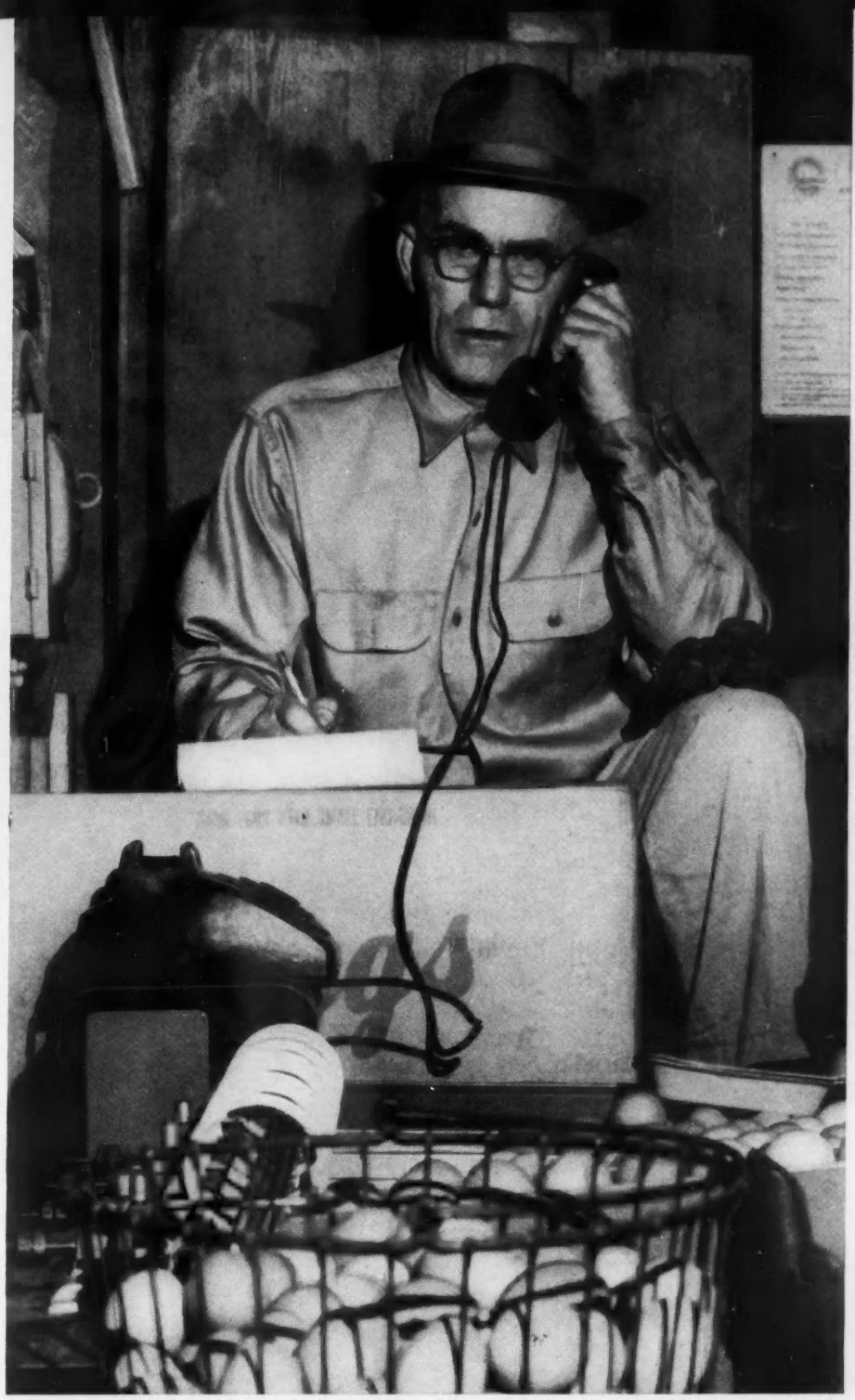
They're three of many farmers who have been featured in Bell System extension advertising addressed to readers like themselves.

Extension phones in outbuildings are important. They are necessary farm tools—to save time, speed crops to market, help run farms efficiently.

In advertising them, we let farmers themselves testify to the usefulness and value of extension phones. They do so in a neighborly, down-to-earth way that's interesting and believable to our readers—farming men and women in every part of the country, served by a great many of the nation's telephone companies.

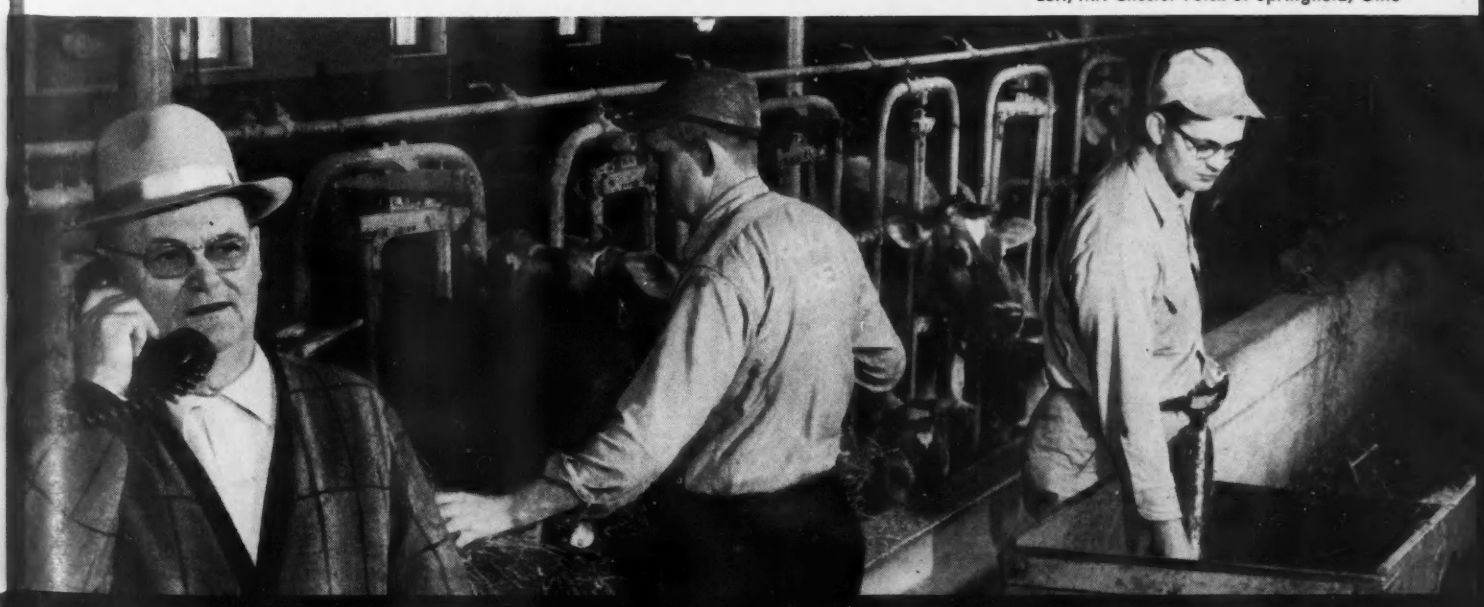
Extension phones on farms are more than a growing source of revenue for the telephone industry. They also offer an opportunity to give better, more useful service to many of our best customers.

BELL TELEPHONE SYSTEM



Mr. Henry Mullins of Gaffney, S. C.

Left, Mr. Chester Folck of Springfield, Ohio



For faster, better tree trimming with less fatigue

Chance *Power* Pruners

These air-powered pruners make a clean one-stroke slice through green branches up to 2 inches in diameter. No splitting or chewing of branches. Jaws re-open automatically after each cut. These lightweight, well balanced tools are easy to use—require no experience to operate from "buckets," ladders, or in trees.

Chance Power Pruners, Guy Strand Cutters and Communications Cable Cutters are air powered. They operate from many power sources — compressors of any type or standard cylinders of dry nitrogen. Insulated and non-insulated models are available.

A. B. CHANCE COMPANY
CENTRALIA, MISSOURI
A.B. Chance Co. of Canada, Ltd., Toronto
CT59-14

(4) *Instrumentalities in place.*
(5) *Employment information.*
(6) *Children and their ages.*
(7) *Are night calls received? Do members of the household belong to clubs, etc?*

As the conversation discloses these facts she jots them down on a reference sheet.

Why Are These Facts Useful?

THESE FACTS are most helpful in deciding what service to recommend, to give the service representatives clues to the buying motives that will appeal to this particular customer, and to provide ammunition to answer objections as they arise.

EDITOR'S NOTE

Got a commercial department problem?? Write it down and send it to Allan R. Stacey, author of "Commercial Department Notes," "Telephone Engineer & Management," 7720 N. Sheridan Rd., Chicago 26, Ill. We'll do our best to give you the correct answer.

Incidentally, a good service representative will let the customer know we ask questions regarding these facts in order to do a better job of suggesting telephone service for him.

The Right Recommendation

HOW DO we make a recommendation that will have the effect we want? The answer is that we make one *complete* recommendation.

What items should this complete recommendation include? At least the following basics should be presented: private line (where available), all users identified (additional listings), the number of telephones and the locations, telephones equipped with coiled cords and in color.

With each major item included in the recommendation should be given a word picture of a benefit that will result from having that piece of equipment. For example, "You won't have to run from the kitchen to the living room when you are busy." This should be restricted to one benefit only because there are disadvantages in giving too many reasons for each item in the recommendation. The disadvantages include a lengthening of the contact, no ammunition left to answer objections, the customer feels we are giving a "big sales pitch," and, finally, too many reasons confuse the customer.

When is the best time to mention the service connection charges? Answer — in the recommendation. We quote the connection charges in one lump sum and we quote the monthly rate in a lump sum.

We close the recommendation with a question such as, "How does this sound to you, Mr. Smith?" When we end our recommendation with a question, we are asking the customer to buy.

Answering Objections and Sale Closing

NATURALLY, you are going to receive objections from the customer until he fully understands what is available for him and how it will be useful to him. He may say, "Too much money!" He sometimes says, "My house is too small." In the August 1st issue we'll take up the two final steps in our "Four Steps to Sales." We'll look at the basic reasons behind objections and see how we can best close the sale. See you then. — *Allan R. Stacey.*

Electronic Symbol Chart

ELECTRONIC symbols commonly used to designate elements of sound and evacuation systems, intercoms, private telephone systems, nurses' call systems, and MCS systems, are now available on a wall chart for the convenience of architects, engineers, and draftsmen.

In designing the chart, DuKane engineers used approved and accepted symbols from several sources, including the American Standards Association, the Institute of Radio Engineers, NEMA, and others.

The electronic symbols are adaptable for use on simplified, single-line block diagrams, or on complete schematics. Included are symbols for electronic devices and assemblies, circuit elements, wiring, and all communications system elements.

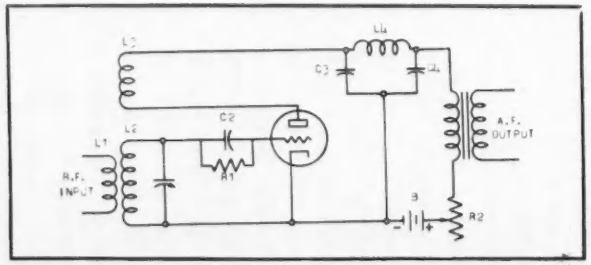
Architects and engineers may obtain copies by writing to *Charts, DuKane Corporation, Dept. TE&M, St. Charles, Illinois.*

TELEPHONE ENGINEER & MANAGEMENT's

ELECTRONICS NOTEBOOK

By LEO G. SANDS

phase with it . . . amplification is increased. This is called "positive" feedback. If the coil is reversed so that is induces an out of phase signal into the grid coil, the amplification will be reduced. This is known



as "negative" or inverse feedback. When the coils are oriented to produce positive feedback, the circuit can "oscillate" and produce RF energy. In a receiver this is undesirable so that a regeneration control is required. Here R_2 is used for controlling plate current. The detector is most sensitive to weak signals when adjusted just below the point where self-oscillation occurs.

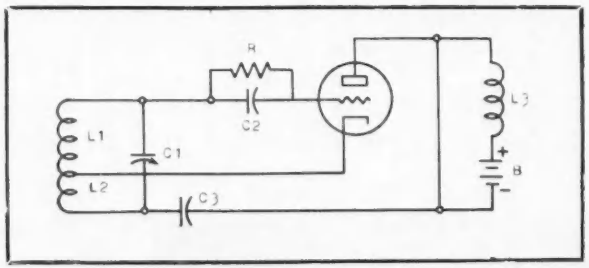
3.2-17 HARTLEY OSCILLATOR

The regenerative detector is, therefore, an oscillator which can produce RF energy. When used as a detector, it is designed to minimize its RF output. However, when RF energy is required, the circuit is so designed that oscillations will continue and RF output is greatest. There are many oscillator circuits. This one is known as the Hartley circuit. It is very similar to the circuit shown in 3.2-16 except

TELEPHONE ENGINEER & MANAGEMENT's

ELECTRONICS NOTEBOOK

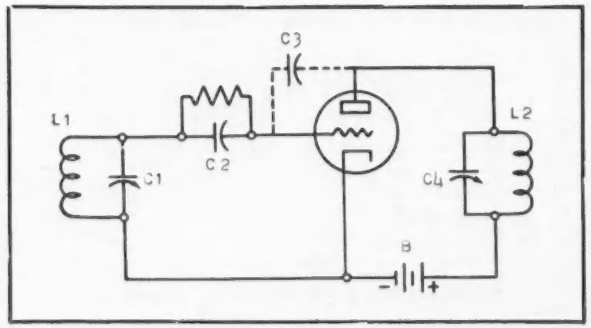
By LEO G. SANDS



that the grid and plate coils have been combined into a single tapped coil. C_3 prevents d-c from flowing through the coil, and L_3, a small inductor, which has high impedance at radio frequencies, prevents the B battery, whose impedence is low, from shunting the plate to ground.

3.2-18 TUNED PLATE-TUNED GRID OSCILLATOR

When the plate and grid circuit are tuned to the



TELEPHONE ENGINEER & MANAGEMENT's

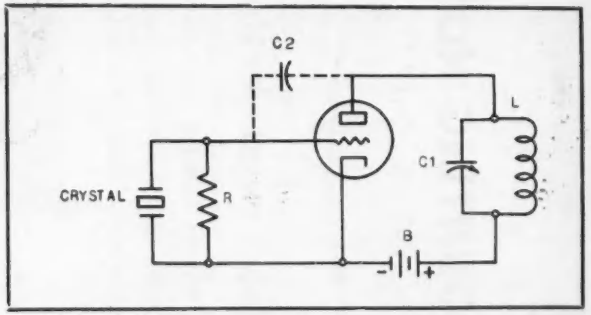
ELECTRONICS NOTEBOOK

By LEO G. SANDS

same frequency but with the plate and grid coils physically separated to prevent magnetic interaction, oscillations will be produced because of the capacitor effect of the tube itself. The plate and grid of a triode act like plates of a condenser and pass in-phase signal voltage back from the plate to the grid.

3.2-19 CRYSTAL CONTROLLED OSCILLATOR

A specially prepared quartz crystal has characteristics similar to a series resonant circuit whose frequency depends upon the physical dimensions of the



crystal. Here a crystal is used in lieu of an inductance and a capacitor in the grid circuit. When C_1 and L are tuned to the same frequency as the crystal, oscillation will occur because of the feedback through the tube whose capacity is represented by C_2 shown connected through the dotted lines. This kind of circuit is particularly desirable because it tends to stay put on one frequency.

More Data For Your "Electronics Notebook" In The Next Issue.

ACCOUNTING NOTES

by G. M. JONES

Inventory Management Methods

In part IV of his review of inventory control systems Doctor Jones discusses "fitting a curve" to the data to predict the probable demand for a given number of units in a week.

Fitting a Curve To The Data

BY A STATISTICAL manipulation called "fitting a curve" to the data, we can predict the probable demand for a given number of units in a week. From this same probability distribution can be found the likelihood of being unable to serve, with a given inventory level.

In the situation given, the weighted average number of items needed in a week is 3.846; the standard deviation of the distribution is 1.823. By making use of these two figures, and a table of "Areas under the curve" we can construct a table showing the likelihood of any given number of items being asked for in a week, as shown in the following tabulation:

Week's requirements	Probability of occurrence	Cumulative probability
0	.033	3.3%
1	.066	09.9
2	.131	23.0
3	.197	42.7
3.846, weighted avg.	.—	50.0
4	.213	64.0
5	.178	81.8
6	.110	92.8
7	.050	97.8
8	.017	99.5
over 8	.005	100.0

All this means is that we have stated statistically what common sense already tells us, that we need to carry at least six items in stock in order to be able to give a satisfactory level of service. What we learn from this statistical manipulation is something that a year's experience does not show: in any two-year period like the year just past, we will find there will be a week when *more* than eight units will be needed. It also tells us that we really don't *have* to have eight units on hand to provide excellent service; for instance, if we keep six items on hand, there would be 48 weeks (93% of the weeks) when we could fill all requests. But what about the other four weeks? In any one of those four weeks, we might run short, one unit, or two, or remotely, three. For the year, in total, this would mean four or five unsatisfied customers. This may not mean *dis*-satisfied customers; more likely, it means a delay in service, probably of one week, because if demand occurs randomly as between weeks, the following week is likely to be of low or moderate demand.

The Author, G. M. JONES, is associate professor of Accounting & Financial Administration, Michigan State University.

If we can afford the risk of more delays in service, we can carry fewer items in stock, knowing with some certainty the probable number of delays. For instance, an inventory level of five units will cost us roughly 19 delays out of 200 orders — probably an unacceptable level of service in most cases.

Now we come to the business of evaluating costs. The costs to consider are inventory carrying costs versus costs of lost service opportunities. If there is any way to attach a price tag to the inability to fill an order, we actually can make cost comparisons that are meaningful in the inventory level decision. For instance, in a commercial establishment, an unfilled order usually means a lost sale, with a definite number of dollars of lost revenue. For a telephone customer of a given class, an unserved need results in sales lost — revenue diverted to the post office or telegraph company, or foregone completely. Sometimes the price of inability to do a job can only be guessed at. But suppose that we are able to put a price tag on a lost service opportunity. We then can compare that price with the cost of carrying the necessary units on hand to prevent these service order failures.

For instance, if the stores items in the situation above cost $100 each, and have a 20% carrying cost, and a delay in service can be said to result in a $10 loss in revenue (or similarly, an incurrence of $10 in otherwise needless expense), and if initially we carry six items on hand, we would find the following comparison:

Cost of delays eliminated by going from inventory of 6 items to inventory of 7 items: 3 or 4 delays @ $10 = $30 to $40.

Carrying charges by holding an additional unit: 1 unit at $100 X 20% = $20.

Clearly it would be economical to add one unit, even though it is seldom needed. But going further:

Cost of delays eliminated by going from inventory of 7 items to inventory of 8 items: 1 or 2 delays @ $10 = $10 to $20.

Carrying charges increased = $20.

Would it be worthwhile to add this last unit of inventory? Probably not.

There are some more elaborate statistical treatments for finding the desired level to maintain under conditions of uncertain demand. Their applicability is somewhat limited because:

(1) There are many critical items where absolute assurance of service is necessary and one cannot risk ever being out of stock;

(2) even though less than a full level of service can be accepted, there may be no way to measure in dollars the "loss" from failure to serve, or

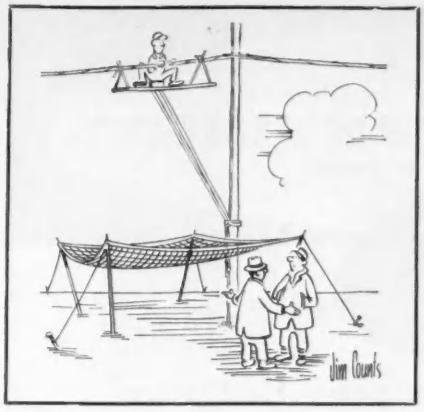
(3) for items of low unit cost, carrying costs are pretty much the same within quite a quantity range, and little could be saved by reducing the item level.

An adequate statistical treatment requires recognition of parts demand situations as being subject to "Poisson Distribution" probability calculations; i.e., where there is large opportunity for failures but a low number of failures, the curve describing the likelihood of occurrence of any quantity bunches toward the left end and requires a different set of tables for application to real situations.

The primary advantage of applying probability calculations to uneven demand for stores items is to indicate quite clearly how many of a given item must be carried if a specified quality of service is to be maintained, i.e., 50% or 80% or 99% of all orders filled immediately. Secondly, in many cases this approach is helpful in showing the added costs that go with increments of improvement in ability to serve.

Following Up For Method Improvement

LIKE ANY other procedural method for help in running a business, any of these ways of managing stores inventory need to be reviewed occasionally as to their effectiveness. The only way to be prepared to measure effectiveness is to keep track of what actually happens. For instance, where an attempt is made to hold an item to the level indicated by the statistical approach, a record should be kept not only of requisitions filled but also of the occasions when we were unable to provide the needed item. This requires a little clerical work over and above that required by the accounting disposition of costs. A second year's experience on what actually happened will provide information for reconsidering the statistical basis for inventory level.



"Of course I believe in safety first . . . But you can overdo anything!"

One complication in applying ABC inventory methods and statistical inventory level determination is the seasonal nature of demand for some items. In these cases, two separate sets of criteria may be necessary, one for winter and one for summer, based on careful study of seasonal requirements.

The importance of regularly scheduled review of inventory *practices* as well as inventory levels cannot be over-emphasized. Take inventory of inventory practices now and then, as a kind of continuing audit. Storeskeepers are only human, and it is easy to bypass sound practices in storing, recording, or issuing things. The methods I have suggested are aimed at holding down investment in stores items without impairing service; the proper use of the items themselves is a matter of proper instructions, personal responsibility, and eternal vigilance. — *G. M. Jones.*

Suggested Readings on Inventory Control:

J. F. Magee, "Guides to Inventory Policy," *Harvard Business Review*, January-February, March-April, and May-June, 1956.

K. J. Cohen, "Determining the 'Best Possible' Inventory Levels," *Industrial Quality Control, Oct.* 1958.

Clark and Ritchie, "Economic Lot Size and Inventory Control," *NACA Bulletin*, February, 1953; also found in Thomas (Ed.) *Readings in Cost Accounting, Budgeting, and Control* (Southwestern Publishing Company, 1955), pp. 379-390.

W. F. Kennon, "Horse Kicks and Inventory Control," *NAA Bulletin*, January, 1959, pp. 11-19.

O. Kral, "Using Statistical Controls as an Accounting and Management Tool," *NAA Bulletin, July*, 1958, Sec. 2, pp. 11-18.

H. G. Theusen, *Engineering Economy* (2nd Ed.), (Prentice-Hall, 1957), pp. 277-282, and 369-371.

Pipe Wrap Tape Brochure

PERMACEL has announced availability of a comprehensive Pipe Wrap Tape Brochure. The six-page booklet lists product data on Permacel 306, 307, and 308 Polyethylene Pipe Wrap Tapes, and Permacel Pipe Wrap Primer EZ4390. A comprehensive chart of pipe wrap coverage data and specifications for use of the tapes is also included.

For your copy of the brochure write: *Permacel, Dept. TE&M, New Brunswick, N. J.*

Aluminum Coated Wires

ACCO ALUMINIZED Steel Wire and Wire Products — steel core wires for ACSR; steel strand guy wire; overhead ground wire; tie wire; messenger wire; telephone wire; chain link fabric and barbed wire — for industrial, institutional and residential uses have been graphically presented in a 6-page folder, DH-537B.

Issued by the *Page Steel & Wire Division, American Chain & Cable Company, Inc., Dept. TE&M, Monessen, Pa.*, it lists the properties and applications of these widely diversified hot-dip, aluminum coated wires and wire products which combine the strength of steel and the corrosion resistance of aluminum in one end product.

PLANT NOTES ON NEW DEVELOPMENTS

by JOHN S. REED

"SPUD" Aids Training Program

New "Stored Program Universal Demonstrator" for training students in the workings of electronic telephone switching systems and digital computers.

Training

WITH THE growing use of computor devices in telephone organizations, training of personnel in the workings of digital computors and electronic switching systems has become quite important. Considerable difficulty is usually encountered by the trainee in understanding how stored-program information processing systems operate and how they can be programmed. Conventional teaching tools are inadequate for this task, while use of a commercial computer for demonstrations tends to overwhelm the novice because of its speed and complexity.

A satisfactory solution has been found in the use of a stored-program relay machine designed and built at Bell Telephone Laboratories specifically as a teaching aid in engineering training programs. It is complicated enough to stimulate the trainee, but still easy to grasp in its entirety.

This device is a miniature information-processing machine under the control of a program stored in a punched card. When this card is inserted in the machine, metallic contacts close wherever holes have been punched on the card.

The program card contains 32 9-bit word locations. Instruction words are read out of the program memory, one at a time, in synchronism with a clock pulse. Clock pulse may be generated automatically every second or it may be generated manually.

JOHN S. REED, TE&M's technical editor, is plant methods supervisor, Lincoln (Neb.) Telephone & Telegraph Co.

The instruction read out is stored in an order register, and displayed on nine lamps on the front panel. Toggle switches under these lamps are used to manually control the order register. Three modes of operation are possible: automatic word with manual clock, manual word with manual clock and automatic word with automatic clock. Mode of operation is selected by means of a rotary switch.

An order translator interprets and executes the instruction in the order register. It also determines the address of the next order to be read. This address is stored in an address register; after disappearance of the clock pulse, it is transmitted to the program memory. The address is displayed on the front panel in both binary and decimal form. Five bits of erasable memory which are individually controlled are used to record information for later use.

Information is fed into the machine via two input keys. The machine gives out information as 3-bit words displayed on the front panel. When the machine gives an output, it locks itself to make subsequent clock pulses ineffective, and sounds a buzzer to attract attention of the operator. The operator acknowledges the output by pressing a release push button under the input keys. This action extinguishes the output lamps, shuts off the buzzer, and unlocks the machine.

The machine can execute 25 different types of instructions. Among them are instructions to read or write in a memory element, to read an input, to transfer unconditionally, to match an input and a memory element, and to give an output. Using these instructions, many interesting programs can be written to perform logical or arithmetic operations.

Although small, the device's logic and memory system includes 29 relays with 500 contacts and about 1,500 wires. There are also 288 "reading fingers" for recognizing sets of instructions fed into the machine

"SPUD" is short for "Stored Program Universal Demonstrator" which is used for training students in the workings of digital computers and electronic telephone switching systems. Matthew Raspanti of Bell Laboratories, an instructor in the switching training program, conceived the idea for the machine and designed its circuits. J. B. Worth, also of the Laboratories did the mechanical design. Mr. Raspanti holds one of the card programs in the above photo, as he steps "SPUD" along to the next step in a calculation.

KEYSTONE Telephone Wire . . .

when and where you need it!

From many convenient locations, quality Keystone Wire is available for the needs of the telephone industry. Keystone offers a full range of Class A line wire in 50M, 85M and 135M tensile strengths. All line wires meet the specifications of A.S.T.M. and A.T.&T. and are approved by R.E.A. Your Keystone Distributor also offers a full line of galvanized bond, tie and construction wire in a full range of gauges. For quality wire—and prompt delivery—contact your nearest Keystone Telephone Wire Distributor or write direct for information.

KEYSTONE STEEL & WIRE COMPANY
Peoria 7, Illinois

Crescent Electric Supply Company
Burlington, Iowa
Cedar Rapids, Ia.
Davenport, Iowa
Dubuque, Iowa
Madison, Wisconsin
Mason City, Iowa
Ottumwa, Iowa
Peoria, Illinois
Quincy, Illinois
Rapid City, South Dakota
Sioux City, Iowa
Sioux Falls, South Dakota
Spencer, Iowa
Sterling, Illinois
Waterloo, Iowa

Dakota Electric Supply Co.
Fargo, North Dakota

Joslyn Mfg. and Supply Co.
Birmingham, Alabama
Chicago, Illinois
Dallas, Texas
New Orleans, Louisiana
New York, N. Y.
N. Kansas City, Missouri
Oklahoma City, Oklahoma
Omaha, Nebraska
St. Paul, Minnesota

Kingsport Electric Co., Inc.
Kingsport, Tennessee

The Mine & Smelter Supply Co.
Salt Lake City, Utah

Line Material Industries
Milwaukee 1, Wisconsin

Nelson Electric Supply Co.
Dallas, Texas
Lubbock, Texas

Jack Pruzan Co.
Seattle, Washington

Southern Electrical Corp.
Chattanooga, Tennessee

Suttle Equipment Company
Chicago, Illinois
Lawrenceville, Illinois

Tennessee Valley Electric Supply Co.
Nashville, Tennessee

Wheeler Lumber Bridge & Supply Co.
Norfolk, Nebraska

British Ropes Canadian Fact., Ltd.
Vancouver, B. C., Canada

Marshall-Wells Canadian Companies, Ltd.
Winnipeg, Manitoba, Canada

. . . by the makers of famous Red Brand Fence

KELLOGG

VOLUNTEER-FIRE-CALL

"gets them on the job quicker"

The installation of a Kellogg ten-line fire reporting system in Star City and another in Buffalo, Indiana central offices, has led Mr. Otho Price, Fire Chief at Buffalo, to report, *"We get more of our firemen on each call, and we get them on the job quicker with the new dial fire alarm system . . ."*

This is typical of community results with the Kellogg Volunteer Fire Call System. Also, it's easily installed. To quote Mr. James D. O'Connor, manager of The Pulaski-White Rural Telephone Co-Operative, Inc., "Since this system uses the regular subscriber phone, we need not install extra phones or occupy needed cable pairs with fire lines . . . it is the answer to the problem facing small communities in regard to fire reporting after conversion to dial."

Your Kellogg sales representative will be glad to explain the many advantages of this system for your community.

KELLOGG Communications Division of ITT
CHICAGO, ILLINOIS

Kellogg Switchboard and Supply Company, 6650 South Cicero Avenue Chicago 38, Ill. Communications division of International Telephone and Telegraph Corporation

For complete list of offices see pages 10-11

with a punched card. Changing the punched card is all that is needed for the machine to perform a completely new task. Its overall dimensions are 24 x 34 x 12 inches, and its weight is 110 lbs.

Testing Manholes for Presence of Explosive & Toxic Gases

UNDERGROUND telephone plant present hazards to telephone employes who must work in manholes. The most dangerous hazard is the accumulation of poisonous or explosive gases in manholes and conduit. Often the man entering a manhole is not aware of the presence of toxic or explosive atmosphere until it is too late. For this reason, most companies have established the practice of ventilating manholes with blowers that bring in fresh air and drive out the tainted atmosphere.

There remains, however, the hazard of an explosion occurring when a manhole is opened or while the ventilating equipment is being placed. For maximum safety, the manhole atmosphere must be first checked by means of reliable gas detection apparatus which checks for the presence of both toxic and explosive gases.

Engineers of the General Tel. Company of California were faced with the problem of hazardous manhole atmosphere in their underground plant located in the midst of a vast

Testing for gas in manholes, General Telephone lineman William C. Gutschlag employs three-in-one kit developed in cooperation with the Mine Safety Appliances Company of Pittsburgh. The M-S-A Gas Testing Kit detects the presence of carbon monoxide and hydrogen sulfide, as well as explosive gases. Former methods required separate testing procedures and took more time.

TELEPHONE ENGINEER & MANAGEMENT'S

PLANT MAN'S

"SPEC" BOOK

Prepared By
Educational Division
TELEPHONE ENGINEER & MANAGEMENT
7720 Sheridan, Chicago 26,
Copyright 1959

(16) Tree and Brush Control — Trimming Trees and Cutting Brush

Using Tree Trimming Equipment — Working in Trees

In all cases where practicable, trees should be trimmed from the ground. An extension handle should be attached to the trimmer handle to reach high points in the trees. For ease in assembling the handles, the trimmer handle may be rested in an upper branch and the extension then joined to it.

The following precautions should be observed in using the tree trimmer:

1. The pulling rope should be operated with short jerks, rather than by applying the weight of the body to the rope in a long, steady pull. The worker then will not be caught off balance when the trimmer blade suddenly cuts through the branch, with the possibility of a bad fall or strain.
2. The trimmer should not be raised beyond comfortable reach of the hands to cut an out-of-way branch. The worker may miss catching the handle when the trimmer falls after cutting through the branch and the handle may then strike him on the head or shoulder.
3. Care should be taken not to jam the trimmer handle between branches as enough leverage may be exerted in this manner to seriously weaken or break the handle when the pulling rope is operated.
4. The worker should watch his footing when working on slippery or uneven ground to avoid serious falls.

(17) Tree and Brush Control — Trimming Trees and Cutting Brush

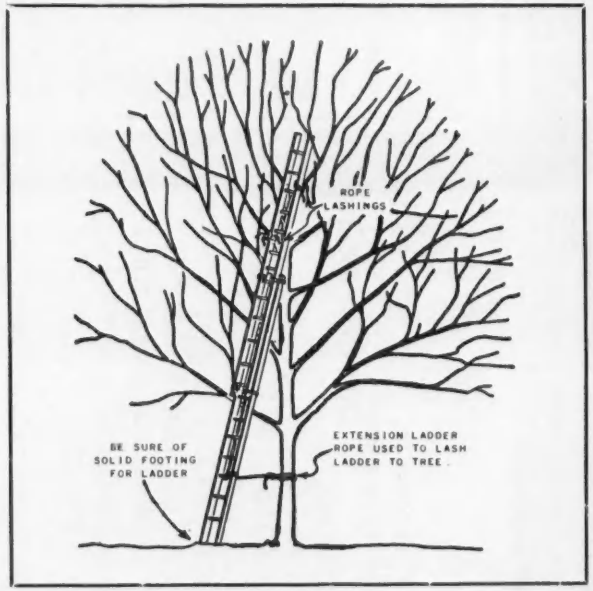


FIG. NINE: — Use of extension ladder for climbing trees.

If it is not practicable to perform the trimming operations from the ground and it is necessary to work in the tree, an extension ladder should be set up and lashed in the tree as shown in *Figure* 9. To facilitate the work of rounding off the tree crown, the top of the ladder should extend about three feet above

More Data For Your "Spec Book" on Page 60.

MEMORANDUM

TO: Company Managers

When you buy rebuilt products,
buy them where they were made!

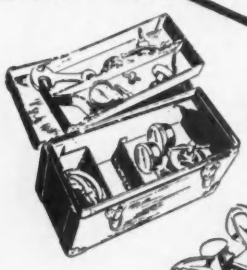
For rebuilt TELEPHONES
SPRING JACKS
LAMP JACKS
LINE RELAYS
CUT-OFF RELAYS
CORD CIRCUIT EQUIPMENT
RELAY SPRING COMBINATIONS
and many other items rebuilt as good as new, go directly to KELLOGG!

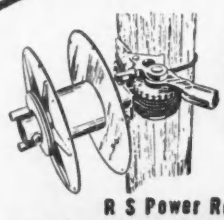
These dependable Kellogg products have all been rebuilt with original factory parts, with the same service and inspection used on new equipment.

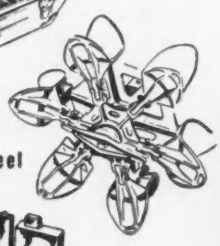
Kellogg Switchboard and Supply Company
6650 South Cicero Avenue, Chicago 38, Ill.
Communications Division of
International Telephone & Telegraph Corp.

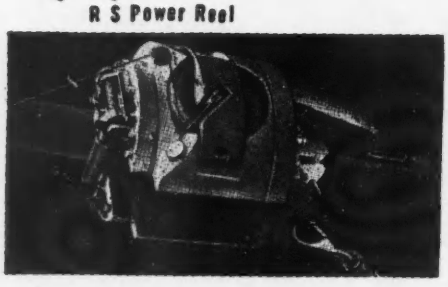
GENERAL MACHINE PRODUCTS COMPANY, INC.
Old Lincoln Highway at
Pa. Turnpike, Trevose, Pa.

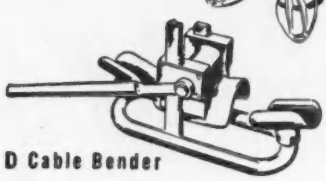
Aerial Tents
Cable Benders
Cable Blocks
Cable Lashers
Coaxial Cable Tools
Lashing Wire Clamps and Grips
Portable & Power Reels


Pressure Testing Kit


R S Power Reel


C R Power Reel




D Cable Bender

Over 450 various items of Line Construction Tools, Maintenance & Pressure-Testing Equipment in stock for immediate Shipment

Special Purpose Tools To Specifications
Literature on Request

SPECIALIZED COMMUNICATIONS EQUIPMENT SINCE 1918
GMPCO

oil producing area in Long Beach. They solved the problem by setting up a procedure which employed a combination of devices for checking the presence of combustible and toxic gases. An instrument kit designed by J. W. Florer, engineer in the methods group at General of California, in cooperation with the instrument engineers at the Mine Safety Appliances Company of Pittsburgh was the result. The kit has since been submitted to General Telephone's system headquarters in New York and is under consideration for adoption as standard equipment in all its operating companies.

A. R. Valantine, director of safety at the California Company, said the testing program was initiated in the Long Beach area, because 14 utility lines carrying oil, gas and other combustibles were involved in the underground system. "Acute need of a more exhaustive method of checking was brought home to us when our crews had to enter the underground system last October to pull through new telephone cable," he continued. "We found up to 100% explosive concentration in some manholes. Lighting a match might have blown up the entire area; since it is surrounded by oil wells." As a result of the findings, the area was closed off until the explosive conditions could be corrected.

Under the new testing practice, the manhole cover is not removed until a sampling has been made with an explosive gas detector, via a small aperture in the manhole cover. The instrument measures the concentration gases or vapors below or above the explosive range. If no combustible gas is present, the manhole lid is partially removed and a second test is made with toxic gas indicators.

The old method employed only one test which required approximately ten minutes to complete and the results were often inconclusive. By integrating the instruments used in the new method into one compact carrying case, and working out a few simple design changes, telephone crews now have a three-in-one instrument that enables them to thoroughly

(Please turn to page 56)

NOW you can test working cable pairs without causing subscriber reports with the MURPHY SILENT BUZZER!

You needed it!

Murphy made it . . . .

the

Murphy Silent Buzzer

for testing cable pairs without causing subscriber reports. It's ready now at a low cost that will amaze you . . . especially when you check these advantages:

- **Eliminates monitoring for busy lines**
- **Never disturbs any line**
- **Faster testing to identify pairs**
- **Super-hetrodyne circuit, battery powered**
- **Loud clear two-tone signal to splicer and helper**
- **Compact and light, 3 x 4 x 5 inches**

Shipping schedule — 90 days, for additional information write

ELECTRONIC RESEARCH DEVELOPMENT MANUFACTURE

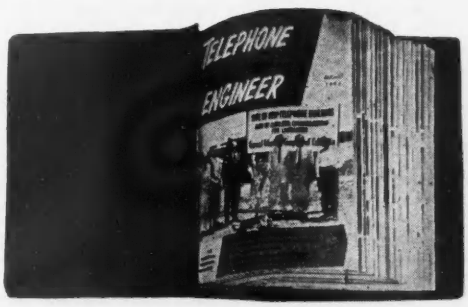
MURPHY ENGINEERING LABORATORIES, Inc.

4419 Tulsa Houston 24, Texas

Now you can preserve and protect your

TELEPHONE ENGINEER MAGAZINES

with this sturdy, full-sized **BINDER**



HOLDS ALL ISSUES FOR A FULL YEAR

$4 each

Bind your copies for QUICK reference in this handsome, durable binder. Each magazine easily inserted.

TELEPHONE ENGINEER PUBLISHING Co.
7720 Sheridan Road,
Chicago 26, Illinois ....., 1959

Gentlemen: I am enclosing $ covering binders @ $4.00 each postpaid

Name .....

Company .....

Address .....

CHARLES
Machine Wks., Inc.
PERRY, OKLAHOMA

AMAZING NEW TRENCHING TOOL!

DITCH WITCH

Lower Trench Cost . . . Usually About 2c a Ft.

MEANS MORE TRENCHING PROFIT FOR YOU

- **Self-Propelled**
- **3 MPH Mobility**
- **7 HP**
- **Digs to 4 FPM, 2' Deep**

Use the right tool for the right job. There is a place for the big trencher, and an equally important place for the smaller portable machine. The difference is one of size–not quality. For trenches up to 6" wide and 2' deep, you simply cannot top the Ditch Witch C-3 . . . in performance, economy or durability! Trench for all types of service lines, underground cables, sprinkler systems, etc.

"Try Ditch Witch and You'll Buy Ditch Witch!" Distributors all over the world sell, rent and service Ditch Witch trenchers. Contractor's service is available everywhere at reasonable rates. For further information, write, wire or call.

CHARLES MACHINE WORKS, INC.
697 Birch St., Perry, Okla.

Gentlemen: Please send the information checked, at no obligation.

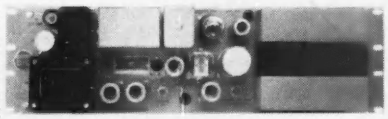
☐ Demonstration ☐ Rental Information
☐ Literature ☐ Contractor's Service

Name_____

Address_____

City_____ **State**_____

FIRST
AND
ONLY
POSTPAY
PAYSTATION
CARRIER



TYPE 46A

WRITE FOR
SPECIFICATIONS
AND
PRICES

CARRIER AND MICROWAVE
BUDELMAN bec

DISTRIBUTORS

BUCKEYE TELEPHONE & SUPPLY CO.
1250 KINNEAR ROAD, COLUMBUS, OHIO
NELSON ELECTRIC SUPPLY COMPANY
1123 SLOCUM STREET, DALLAS 7, TEXAS
TELEPHONE ELECTRONICS
P.O. BOX 571, STOCKTON, CALIFORNIA
THE ENGINEERING SERVICE
P.O. BOX 178, BUTTE, MONTANA
EXPORT
TELE-RADIO SYSTEMS LTD.
3534 DUNDAS ST. W., TORONTO 9, ONT.
WESTREX INC.
111 EIGHTH AVENUE, NEW YORK 11, N. Y.

BUDELMAN
ELECTRONICS
CORPORATION
375 FAIRFIELD AVE., STAMFORD, CONN.

check a given manhole in less than three minutes.

General of California now has 125 of these testing kits in use throughout its system, and additional kits are on order.

"Since instituting this more comprehensive testing procedure, several of our crews have found both explosive and toxic concentrations of gases in connection with underground conduit work projects," Valantine stated. "Once the word got around, there was no need to urge other crews to make thorough tests before proceeding with underground work assignments," he added.

QUESTION: — *In our area, we have several unattended dial offices that are exposed to hot summer weather. Temperatures inside the buildings have been as high as* 120° *F. What would be the effect of these temperatures on the equipment and what should be done to cool the buildings if that is really necessary?*

ANSWER: — High temperatures will not affect the operation of central office switches and relays, but will reduce the life of the central office battery by as much as one quarter. The real trouble, however, comes from high humidity, which in combination with dust, will adversely affect relay and switch operation. The buildings should be tightly closed so that no outside air will get inside the building. If it is necessary for men to work in the buildings, it is advisable to use an air conditioner that does not bring outside air into the building. In addition to cooling the building for work comfort, this equipment will reduce room humidity. A ¾-ton room air conditioner with sealed internal vent to keep air from being drawn into the room will provide sufficient cooling for most small central offices. The filter in commercial air conditioners is not adequate to keep out extremely small dust particles which cause the most trouble. This is the reason for sealing the internal vent so only the inside air will circulate.

QUESTION: — *We are using plastic insulated station wire when installing telephones. If the wire insulation is damaged, what would you use to repair the damage? Tape doesn't do a good enough job.*

ANSWER: — There is available a vinyl cement that can be applied to polyvinyl chloride insulation. After the cement dries, it provides good insulation with good flexibility. This product comes in a small tube, making it easy to apply and to keep in tool kits.

QUESTION: — *What is the standard polarity arrangement for identifying conductors in telephone station wiring?*

ANSWER: — The standard polarity arrangement as used by the majority of telephone companies is the following:

(1.) *Cable terminal connections.* The right hand terminal post is connected to the negative or "ring" side of the cable pair and the left hand post to the positive or "tip" side of the pair. The ring side has negative battery on it and is identified by a

EDITOR'S NOTE
Got a problem?? Write it down and send it to John S. Reed, Technical Editor, "Telephone Engineer & Management," 7720 N. Sheridan Rd., Chicago 26, Ill. We'll do our best to give you the correct answer.

NOW!

CORRUGATED SHIELDING IN ALL CABLE SIZES!

Only Superior has it!

New, exclusive development provides corrugated shielding on SUPERIOR Aerial, Duct and Direct Burial Cables from 6 to 900 pair sizes.

For complete information and prices, write

SUPERIOR CABLES

SUPERIOR CABLE CORPORATION

Hickory, North Carolina

4104

In addition to their regular stock and custom transformers for the electronic industry, ADC has long been a dependable source of transformers and filters to the telephone and telegraph industry. When Western Electric announced they would no longer supply these components to manufacturers, ADC put their 24 years of experience to use designing and tooling a series of "coils" which are electrically and physically interchangeable with similar components made by The Western Electric Company. Many of these are in stock. If you use such components, we suggest that you write for more information. We believe you'll be pleased with both the price and delivery.

WRITE TODAY FOR TELEPHONE COIL LITERATURE

ADC AUDIO DEVELOPMENT COMPANY
2846-13th Avenue South • Minneapolis 7, Minnesota
TRANSFORMERS • REACTORS • FILTERS • JACKS & PLUGS • JACK PANELS

loud click when the test handset is connected between it and ground (cable terminal frame).

(2.) *Drop wire.* The conductor with tracer (raised ridge) is the negative or ring conductor.

(3) *Interior (inside) wire.* The red (single tracer) conductor is negative or ring, and the green conductor, positive or tip. The third conductor which is yellow is used for the ground connection needed in party line systems.

(4.) *Instrument cord.* The color code of the line cord conductors varies with the make of the telephone instrument, and it will be necessary to follow the manufacturer's label or data sheet in connecting the set to the line.

(5.) *Buried Wire.* One conductor is tinned and the other is not. The tinned conductor is regarded as the negative or ring side.

Application Procedure Booklet

LINEMEN installing Preformed "Armor-Grip" Suspension on overhead transmission lines can now make quick and easy field reference to the proper application procedure by using a new booklet that presents step-by-step illustrated instructions.

Because the compact, 12-page Application Procedure Booklet slips into a pocket, it is a handy size to use on the ground or overhead. Write for AGS Application Procedure Booklet 40-300 to *Preformed Line Products Co.*, 5349 *St. Clair Avenue, Dept. TE&M, Cleveland* 3, *Ohio.*

Microwave Equipment

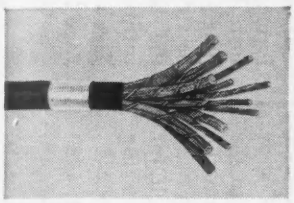
GENERAL Electric's new "Dual-Beam" Microwave equipment is described in Bulletin ECM 91, available from *G-E Communication Products Department, Dept. TE&M, Lynchburg, Va.*

Bulletin explains how the "Dual-Beam" concept offers additional protection against unpredictable communication failures by techniques usually found in automatic standby equipment. Cross-polarization of antennas makes continuous parallel operation of two sets of RF equipment possible, thus increasing reliability.

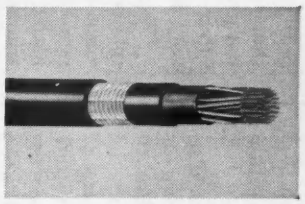
Call on Anaconda for all your telephone cable needs!

Here's the full line designed by the independent manufacturer to the independent telephone industry

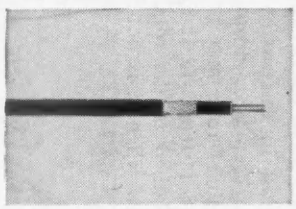
PLASTIC-INSULATED CABLES



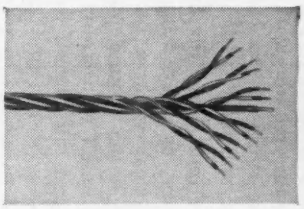
Anaconda Alpeth Type ALP Aerial & Duct Cable (No. 19, 22 & 24 Awg). Polyethylene insulated; full color code; 8-mil longitudinal aluminum shield; high-molecular weight polyethylene jacket.



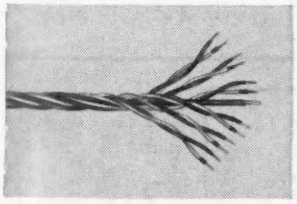
Anaconda Type PCP Direct-Burial Cable (No. 19, 22 & 24 Awg). Polyethylene insulated; full color code; polyethylene belt; 5-mil longitudinal copper shield; polyethylene jacket.



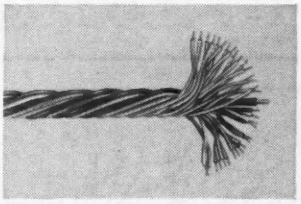
Anaconda Type BW Buried Distribution Wire (No. 19 & 16 Awg). Two conductors, parallel; insulated with polyethylene; oval in shape; flat-steel wire serving, asphalt coating, Densheath* jacket.



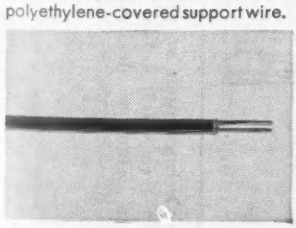
Anaconda Type RD Rural Distribution Wire (No. 19 Awg). Conductors insulated with polyethylene, jacketed with color-coded Densheath; pairs assembled around polyethylene-covered support wire.



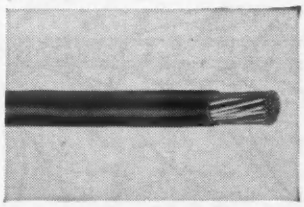
Anaconda Type SD Suburban Distribution Wire (No. 22 Awg). Conductors insulated with polyethylene, jacketed with color-coded Densheath; pairs assembled around polyethylene-covered support wire.



Anaconda Type UD Urban Distribution Wire (No. 24 Awg). Densheath-insulated conductors; color-coded pairs assembled around polyethylene-covered support wire.



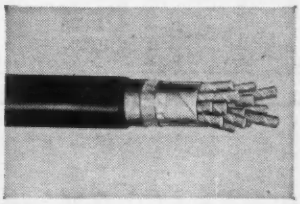
Anaconda Type CR Single Pair Parallel Distribution Wire (No. 14 Awg & .080" Copperweld). Two conductors parallel; insulated with high-molecular weight polyethylene, oval in shape.



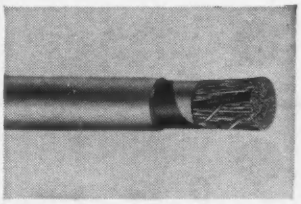
Anaconda Type IC Inside Telephone Cable (No. 22 & 24 Awg). Densheath-insulated inside telephone cable; nonfading color-coded pairs with corrosion-resistant Densheath jacket overall.

*Reg. U. S. Pat. Off.

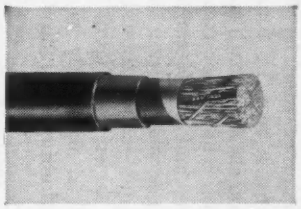
PAPER-INSULATED CABLES



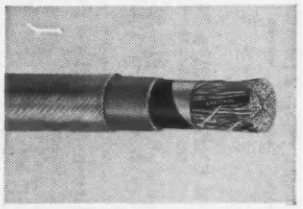
Anaconda Type STAL Paper-Insulated, Stalpeth-sheathed Cable (No. 19, 22, 24 & 26 Awg). Paper insulated; aluminum & coated-steel tapes longitudinally applied; polyethylene jacket.



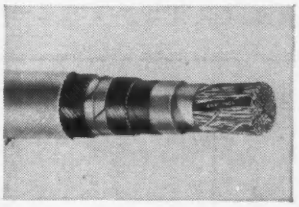
Anaconda Type PL Paper-Lead Cable (No. 19, 22, 24 & 26 Awg). Single-paper-tape insulated telephone cable, paper core covering over assembled pairs; antimony-lead sheath overall.



Anaconda Type PLP Paper-Lead Polyethylene Protected Cable (No. 19, 22, 24 & 26 Awg). Paper insulated, paper core covering, assembled pairs; antimony-lead sheath, polyethylene jacket.



Anaconda Type PLJ Paper-Lead, Jute-Protected Cable (No. 19, 22, 24 & 26 Awg). Single-paper-tape insulated, paper core covering over assembled pairs; antimony-lead sheath; jute serving overall.



Anaconda Type PLBT Paper-Lead, Tape-Armored Cable (No. 19, 22, 24 & 26 Awg). Paper insulated; antimony-lead sheath; impregnated-paper tape; jute; flat-steel tapes; nonadhesive coating.

For all your telephone needs, call the Man from Anaconda. He will be happy to provide you with further information. Write for Bulletin #DM-5833 on Anaconda Alpeth and/or #DM-5771 on Anaconda Stalpeth and Paper-lead cables. Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y. 59221 Rev.

PHONE THE MAN FROM

ANACONDA®

FOR TELEPHONE CABLE

the independent manufacturer for the independent telephone industry

TELEPHONE ENGINEER & MANAGEMENT's

PLANT MAN'S 'SPEC' BOOK

(18) Tree and Brush Control — Trimming Trees and Cutting Brush

the topmost cuts to be made. From this position, the worker can more easily see where the cuts should be made to obtain the best results.

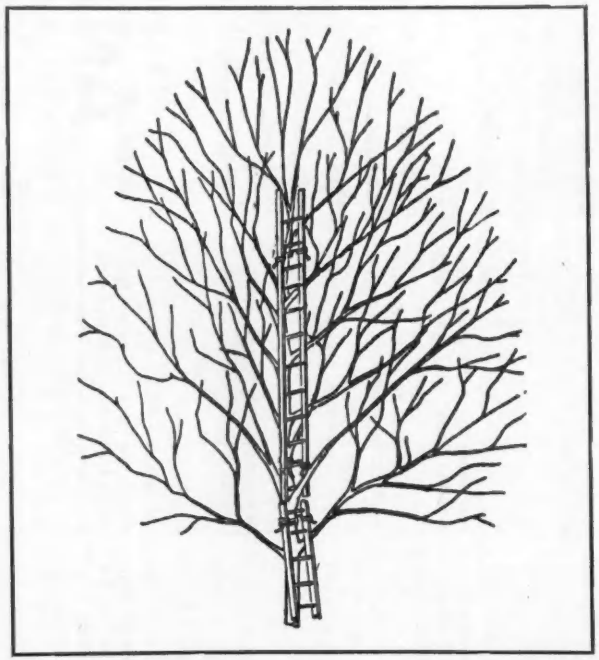


FIG. 10: — Using upper section of extension ladder lashed in tree when ladder is not long enough to extend to desired height.

TELEPHONE ENGINEER & MANAGEMENT's

PLANT MAN'S 'SPEC' BOOK

(19) Tree and Brush Control — Trimming Trees and Cutting Brush

For reasons of safety, trees should not be climbed in any other manner than by using a ladder. In certain situations, it may be found that the extension ladder is too short to reach to the desired height from the ground. The ladder may then be separated into two sections and the upper section pushed into the tree from a secure position on the lower ladder section. The upper section should be lashed in place with rope as shown in *Figure* 10. Although this method should be used only as a last resort, it is preferable to climbing trees directly to work at the desired height.

To hold himself securely in position on the ladder while trimming the tree, the worker should hook one leg between the rungs of the ladder. This position assures him ease and safety while using his tools.

If the worker must leave the ladder to work elsewhere in the tree, as when using a docking saw or getting in the clear while a limb is being broken off by a man on the ground pulling on ropes, he should secure himself to a strong limb by means of his safety belt and put himself in a reasonably comfortable position as shown in *Figure* 7. In using the saw, he should assume a position that will keep sawdust from blowing into his eyes. If he cannot avoid the sawdust in this manner, he should wear eye goggles. To keep from dropping the saw to the ground, a length of rope may be snapped onto the saw handle and fastened to the body belt. A wire hook may be lashed to the rope near the belt for carrying the saw when it is not in use. In working

TELEPHONE ENGINEER & MANAGEMENT's

PLANT MAN'S 'SPEC' BOOK

(20) Tree and Brush Control — Trimming Trees and Cutting Brush

in and around trees, linemen's climbers should never be worn.

Shaping Trees

In general, trees are trimmed once every two years, sufficient clearance being obtained each time to last until the next trimming. The amount of foliage to remove each time depends on the rate of tree growth and the property owner's desires as to the amount of pruning. Except in the case of trees that grow at the rate of two or more feet per year, about four feet clearance will be sufficient. Excessive pruning or improper trimming methods, however, greatly stimulate the growth of sprouts so that no clearance at all may result within a comparatively short time. A prolonged wet season or other abnormal conditions stimulating plant growth may also shorten the trimming cycle.

The time of the year when trees are trimmed is relatively unimportant as trees can stand a moderate amount of trimming even during the most active periods of tree growth. Certain trees such as the maple and beech, however, will bleed excessively if trimmed quite heavily during the growing season.

In addition, trees can stand heavy topping performed during the dormant period better than when such denuding is done at other times. It is easier to judge which branches should be removed for the best results when the trees are bare of leaves, and the branches are more easily shaken down after cutting. The property owner generally is less likely to

TELEPHONE ENGINEER & MANAGEMENT's

PLANT MAN'S 'SPEC' BOOK

(21) Tree and Brush Control — Trimming Trees and Cutting Brush

object to the pruning work when it is done during the dormant period. On the other hand, it is sometimes advantageous to trim trees in the growing season for the reason that longer lasting clearance is obtained when this work is performed during that time, as pruning then has a less stimulating effect on sucker growth. This makes it possible to trim trees with less clearance when this is requested by the property owner.

The extent to which a tree may be trimmed at the time an open-wire lead is constructed, in order to maintain its health and insure its good appearance, is illustrated in *Figure* 11. No more wood should be removed than will insure that life is maintained in the parent limb and normal healing of the wounds will occur. In addition, when removing side limbs from a tree trunk, no more than 20 percent of the trunk circumference should be left as exposed wound area.

In shaping trees, the best results are obtained when the trees are trimmed as nearly as possible in accordance with their natural growth form. In certain cases, this may not be practicable on account of the position of the trees in relation to the line wires, and it is then necessary to resort to the following methods to keep the foliage away from the line wires without detracting too greatly from the appearance of the trees:

1. *Large tree situated directly under line with branches growing through the wires*: If the appearance of the tree would be spoiled by rounding off the crown, or there is danger of killing

TELEPHONE ENGINEER & MANAGEMENT's

PLANT MAN'S 'SPEC' BOOK

(22) Tree and Brush Control — Trimming Trees and Cutting Brush

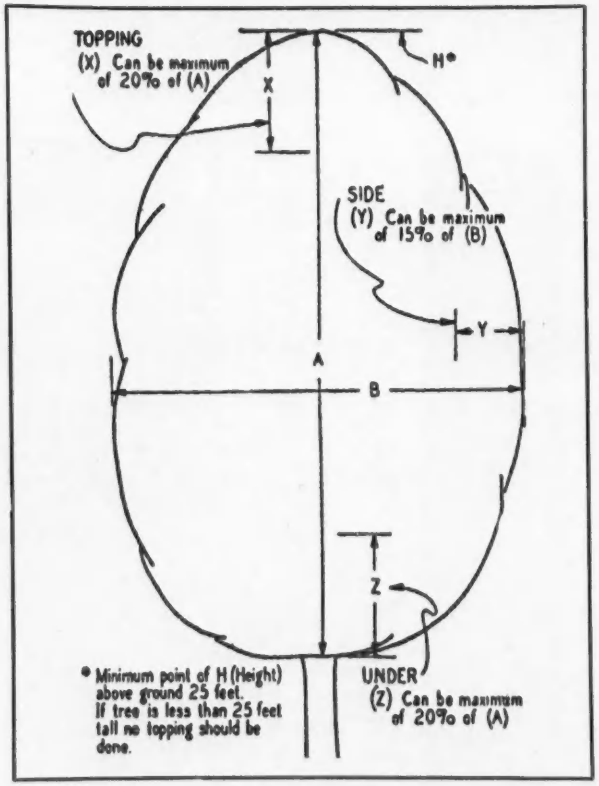

TOPPING
(X) Can be maximum of 20% of (A)
X
H*
SIDE
(Y) Can be maximum of 15% of (B)
Y
A
B
Z
UNDER
(Z) Can be maximum of 20% of (A)
* Minimum point of H (Height) above ground 25 feet. If tree is less than 25 feet tall no topping should be done.

FIG. 11: — Indicating extent to which a tree may be reduced in size to provide clearance at time of line construction.

TELEPHONE ENGINEER & MANAGEMENT's

PLANT MAN'S 'SPEC' BOOK

(23) Tree and Brush Control — Trimming Trees and Cutting Brush

a mature tree by excessive topping, the crown may be notched to clear branches away from contact with the line wires. The notch should be made as inconspicuous as possible by rounding off corners and edges as shown in *Figure* 12.

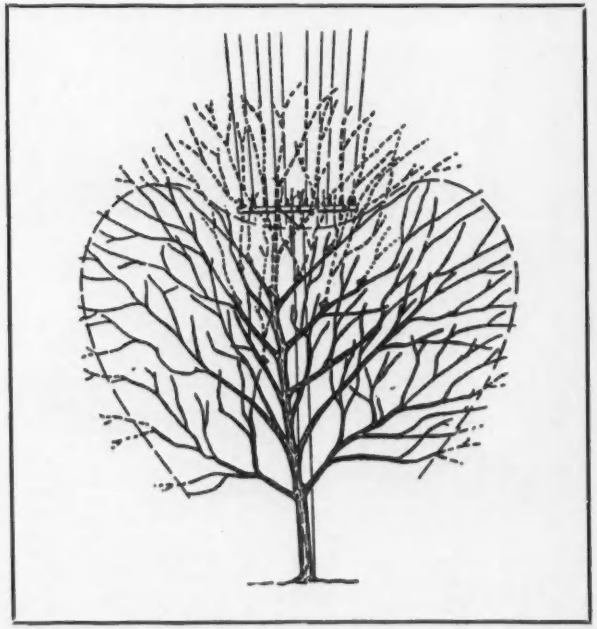
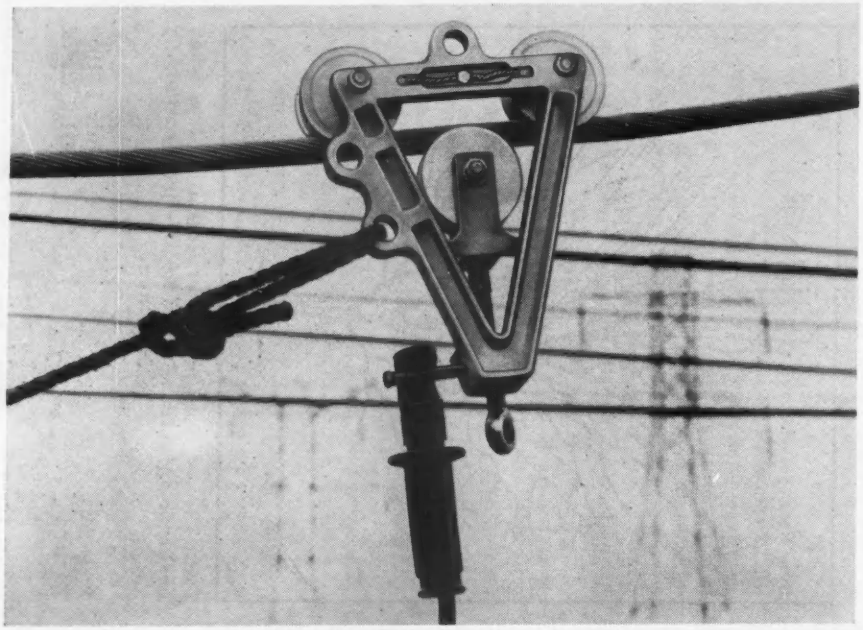


FIG. 12: — Notching upper crown of tree when health or appearance would be affected by rounding off crown.

More Data For Your "Spec Book" on Page 65.



Bashlin No. 795 Traveling Ground

NEW PRODUCTS' SHOWCASE

By DICK REYNOLDS

Traveling Ground

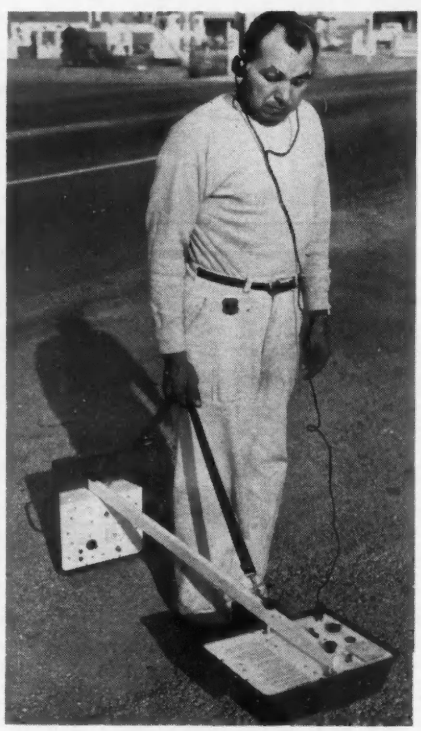
W. M. BASHLIN Company has added another safety device to their line of industrial and utility safety tools. It is the new Bashlin No. 795 precision built Traveling Ground.

Features of the traveling ground recognizable as essential to safe wire stringing are: positive ground, light weight, eye for hotstick pickup, bronze oiled bushings, brush pickup with shunts to common ground, brass shoulder bolt axle, adjusts for conductors to and including 795,000 cm. ACSR, all parts replaceable, shouldered pin to attach ground clamp, operates in either vertical or horizontal position, can be installed without threading through, and a Heli-Coil thread used in the frame.

For further information *Check NP* 228.

Pipe Valve & Cable Locator

A NEW transistorized pipe valve and cable locator has been recently put on the market by Gardiner Electronics Co. It features a single turn transmitting and receiving coil cast right into the fiberglass case. The transmitter and receiver are powered by 4 flashlight batteries each and give an average life of 1400 hours.



It uses a total of 10 transistors, 3 in the transmitter and 7 in the receiver.

The transmitter has a switch to allow for good and poor conductive ground and the receiver has a 3 position sensitivity switch plus a variable gain control. The transmitter and receiver each have a built-in battery tester. It has an adjustable height drop handle to allow for men of different height. Operating instructions are printed on the receiver panel. *Check NP* 229.

Communication-Cable Cutter

THE AIR-POWERED Communications-Cable Cutter, offered by the A. B. Chance Co., cuts lead and plastic-sheathed cable up to 3¼ inches in diameter. Simple in design, it requires no experience or skill to operate.

This tool cuts completely through

the cable in one clean stroke, leaving the severed ends smooth and even for splicing. Light but firm thumb pressure operates the triggers. Once the trigger is tripped and held in closed position, cutting action of the blades is continuous. Thus there is no danger of cutting just partly through a cable. Blades open automatically after each cut. *Check NP* 230.

Self-Propelled Trencher

THE DAVIS Pup, a new portable, self-propelled utility trencher, is now being manufactured by Davis Mfg. Inc. It is designed for L-P Gas dealers who install complete systems.

Unit trenches from 2-inches to 3-inches wide and down to depths of 3-feet. Once it has started trenching no operator is needed except for casual observation and to stop the unit.

It has a positive, variable speed

when this happens...

are you fully protected?

photo by Don Polic

1909 50TH ANNIVERSARY Reliable 1959

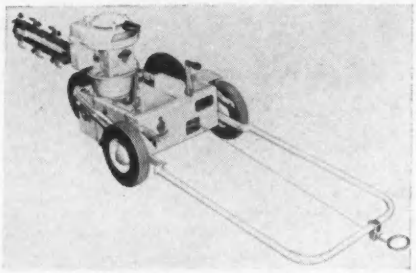
Reliable

ELECTRIC COMPANY • FRANKLIN PARK, ILLINOIS

A SYMBOL OF INTEGRITY SINCE 1909

Complete line of station and high voltage protectors

drive with a unique winching mechanism that draws the Pup down the line to be dug. Six different speed

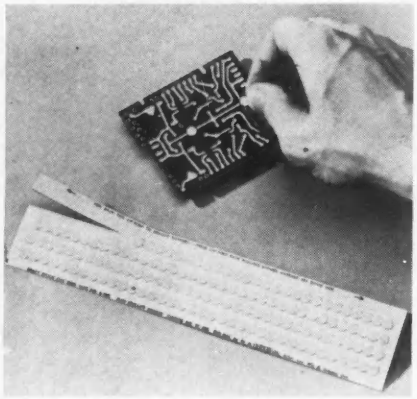


settings as well as neutral and stop-forward motion are controlled by a single lever. It will attain speeds up to 400 feet per hour. *Check NP* 231.

Self-Sticking Solder Masks

PRE-CUT, self-sticking masks are now available from W. H. Brady Co.

The circular masks, from 1/4″ O. D. to 3/4″ O. D., are mounted on portable dispenser cards for assembly line application to semi-finished printed circuits before dip soldering. The thin, .003″ crepe-backed masks, made from



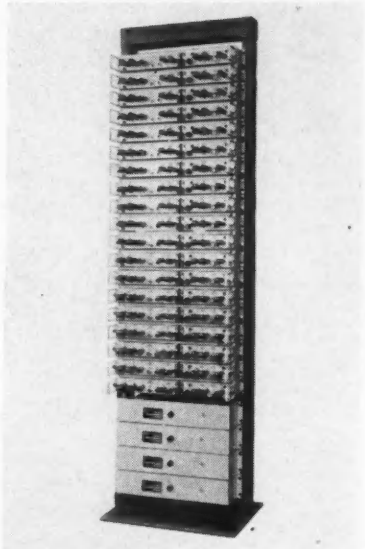
pressure-sensitive B-540 tape, adhere to metal and phenolic surfaces with finger pressure. They withstand 700° dip soldering temperatures of six seconds and remove clean and free from the circuit card, leaving no adhesive residue. The mask adhesive contains no sulphur, free chlorine or salts to set up electrolytic corrosion. *NP* 232.

Carrier System

RAYTHEON Company has announced a new 24-channel FM carrier system for channelizing its MCR-1000 microwave radio communications link. The B-640 multiplex carrier features transmitter crystal-control, miniaturized plug-in assembly, and full compatibility with telephone transmission standards.

The B-640 provides voice channels over FM subcarriers in the 40 to 420 KC base band. Carrier equipment may be separated from the associated RF equipment by several miles of wireline or cable. The system design includes optional transistorized repeaters.

Available signalling includes E and M dial, ringdown, common battery loop, VHF control, and other special microwave services. Each basic channel-terminal unit is so designed



that it will operate with any of these signalling methods by proper strapping.

Equipment is powered from either 48 volt batteries or 115 volt AC mains. The AC power supply uses silicon diode rectifiers, long-life magnetic components, and telephone-type capacitors. *Check NP* 233.

Sewer & Drain Cleaner

A NEW folding handle electric eel sewer and drain cleaner is available from The Ohio Tool & Engineering Co.

The handle can be raised to operating position or folded to transport or storage position without adjustment of any kind.

Unit itself can be used on lines from 3″ to 12″ in diameter and will run up to 250 feet. The motor is of the condenser type — is back-geared 3 to 1 — and is equipped with a slip clutch mounted directly to the back geared shaft. The cable is of dual construction and consists of an inner member wound left-hand and an outer member wound right-hand.

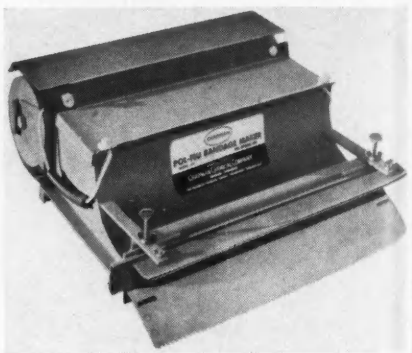
The cable self-feeds both in and out of the line (even through "I" traps) — and is non-helixing. All

manual handling of the cable is eliminated and the machine is completely safe to operate. *Check NP* 234.

Pol-Nu Bandage-Maker

THE Pol-Nu Bandage-maker, a device developed by Chapman Chemical Company, is a portable machine that produces pole bandages of any size as they are needed. It was designed for use with Chapman Pol-Nu grease-type preservative.

New features of the unit include a spindle rod and brackets for feeding the 300-foot rolls of poly-kraft



into the device, a removable top which keeps trash from falling into the hopper and also protects the paper roll, and rope handles for ease in carrying the machine.

Auxiliary improvements include the addition of inch-markings on the paper rolls to simplify measurement of bandages as they are produced, and a plywood base available for users who wish to mount the device on a pick-up truck bed. A knife

TELEPHONE ENGINEER & MANAGEMENT's

PLANT MAN'S 'SPEC' BOOK

(24) Tree and Brush Control — Trimming Trees and Cutting Brush

This method should be used only as an alternative when the property owner will not consent to the removal of the tree.

2. *Large tree located so that the line wires pass through the tree near the center of the crown*: In the case of a mature tree, the crown will have to be notched in the same manner as in the preceding paragraph. No side notch, however, should be made.
3. *Large tree located to one side of the line with branches on side tending to grow into the wires*: Usually it will be found that an ugly side notch has been made in the tree crown in order to remove interfering branches. The remedy is to trim off the lopsided part of the crown to match the part removed in making the side notch, and then round off the sides of the tree to make it appear less squatty. If no side notch has been formed, the interfering branches should be cut back and the other sides of the tree trimmed in a like manner to restore the tree balance.
4. *Tall tree growing close to one side of the line with wires passing through its lower branches*: This calls for under trimming, i.e., the removal of the lower branches back to the trunk of the tree as shown in *Figure* 5.
5. *Tree overhanging the line*: There should be more than the usual amount of clearance between the lower tree limbs and the wires to allow for the weight of snow and ice bending down the limbs. If a close overhanging limb can-

TELEPHONE ENGINEER & MANAGEMENT's

PLANT MAN'S 'SPEC' BOOK

(25) Tree and Brush Control — Trimming Trees and Cutting Brush

not be removed, some of the branches near the end of the limb should be cut off to reduce its weight and permit it to rise, thus increasing the clearance from the line wires.

6. *Line wires passing through the center of the tree and surrounded by branches*: If it is impossible to get the owner's consent to cutting down the tree or to have the line wires moved out of the way of the tree, all interfering branches should be removed and split crotches reinforced. Offshoots should also be trained to grow away from the wires.

In certain situations, trees with large extending limbs or weak, easily split crotches may be found growing close to a wire lead. Such trees are a hazard to the line and, if it is not possible to remove such limbs, it will be necessary to reinforce the limbs in the following way:

1. Bore a hole through the two limbs at the split crotch and insert a regular crossarm bolt of the proper length though the hole. Use square washers at each end of the bolt and cut away the bark under the washers so that the latter will bear against solid wood when the bolt is tightened. In the case of large limbs, another bolt parallel to the first one may be needed for greater strength.
2. For small and medium sized limbs, use drive hooks and 109 steel wire to brace the limbs several feet above the crotch as shown in *Figure* 13. Draw the limbs together with block and

TELEPHONE ENGINEER & MANAGEMENT's

PLANT MAN'S 'SPEC' BOOK

(26) Tree and Brush Control — Trimming Trees and Cutting Brush

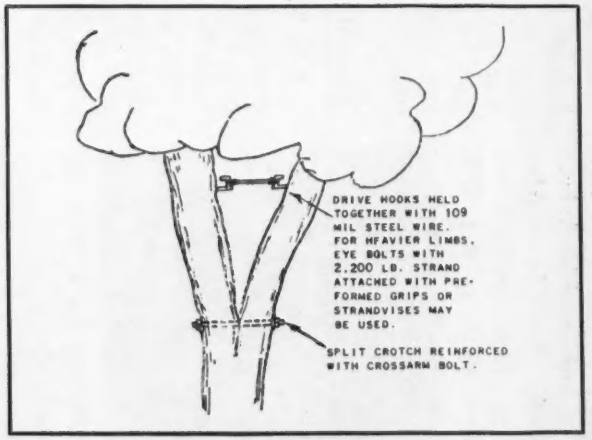

DRIVE HOOKS HELD TOGETHER WITH 109 MIL STEEL WIRE. FOR HEAVIER LIMBS, EYE BOLTS WITH 2,200 LB. STRAND ATTACHED WITH PREFORMED GRIPS OR STRANDVISES MAY BE USED.
SPLIT CROTCH REINFORCED WITH CROSSARM BOLT.

FIG. 13: — Method of reinforcing weak crotch in tree.

tackle, first protecting the limbs with burlap wrapped around them. Attach the wires to the drive hooks.

3. To support heavier limbs, use eye bolts and 2,200 pound strand, with washers on each end of the eye bolt. Use Preformed grips or Strandvises with bails through the eyes and connect the strand ends together.

In addition to the regular pruning of trees for clearance, all dead, diseased, or weak branches should be removed. This is especially important in the case of tall trees overhanging wire leads, an account of the danger of broken limbs falling on the line wires.

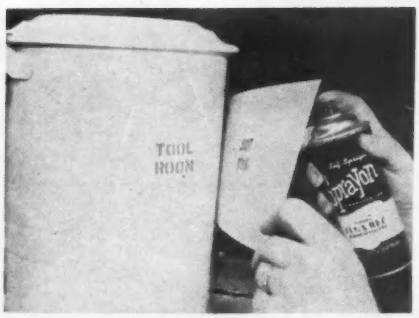
More Data For Your "Spec Book" In The Next Issue.

groove in the base simplifies cutting bandages to proper length. *NP* 235.

Aerosols For Industry

A COMPLETE line of aerosol products for industry use is now being manufactured by Sprayon Products, Inc. The new line consists of 47 maintenance and production aids in self-spraying containers. The aerosol cans are ready for instant use anywhere and require little or no preparation or clean-up.

The Sprayon line includes color

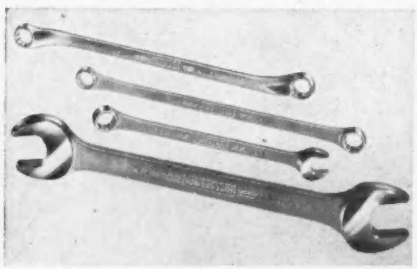


code enamels and marking paints, standard equipment finishes, special lubricants, protective coatings, and de-greasers. It covers virtually every self-spraying product used in industry, from silicone mold release to blue layout fluid. *Check NP* 236.

Box Wrenches

J. H. WILLIAMS & Co., is now making a line of open-end, combination box-open end and 15° and 45° offset box wrenches of improved design.

Among the many new features to the line are slimmer, more comfort-



able handles, smoother contours and strong, thin heads that allow maximum clearance in close quarters. The new design has imparted a "balanced feel" throughout all sizes in the four styles of wrenches offered. *Check NP* 237.

Gear-Draulic Trencher

A NEW model Auburn Gear-Draulic Trencher for International Harvester 340 and 460 Utility tractors has been announced by Auburn Machine Works, Inc. The trencher will trench at widths from 6 to 14-inches and at depths to 6 feet. It

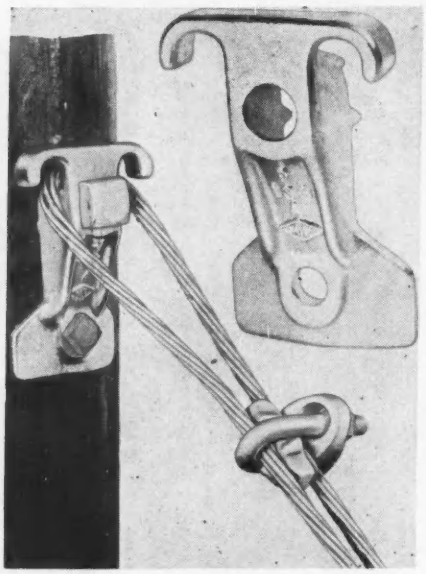
reputedly will dig up to 800 feet of trench per hour.

It has a unique forward propulsion drive utilizing a specially installed power-take-off that transfers power from the tractor through a combination variable hydraulic drive and speed reducer, to a geared tractor that, in turn, returns power back into the tractor's power train at a "creep" speed.

The variable hydraulic drive automatically adjusts the forward speed to intermittently changing soil conditions for uninterrupted smooth trenching. *Check NP* 238.

Guy Hooks

A NEW improved MIF Guy Hook has been announced by Malleable Iron Fittings Co. These guy hooks will accept all types of guy deadening devices from 0 to 90° permitting



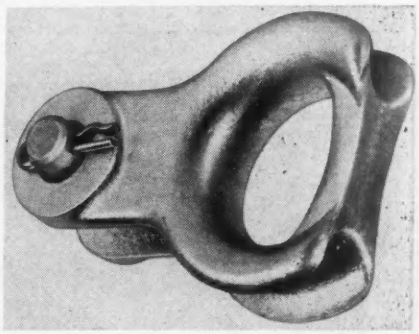
the use of one attachment for both down and span guys.

The made up guy hook can be installed at any time during construction, either before or after pole is set. Channel shape of the back provides fitting to any pole diameter and ears accept a wide range of strand diameters. *Check NP* 239.

Thimble Clevis

A NEWLY designed thimble clevis for dead ending strand or cable messenger has been announced by Malleable Iron Fittings Co.

The method of manufacture produces a smooth groove eliminating chafing of the soft strand. The thimble diameter (2¼″) maintains the shape of the strand, and the tie

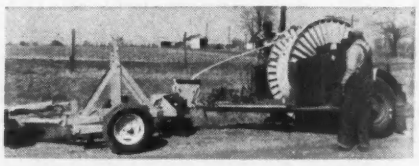


bar will accommodate a hook for stringing and tensioning operations. Strand diameters up to ⅞ in. can be used. *Check NP* 240.

New Cable Layers

TWO NEW cable layers, designed for laying of flexible cable or plastic pipe, have just been introduced by International Harvester Co.

The International No. 1 direct-



connected cable layer is built for use with Farmall and International tractors with two-point Fast-Hitch. The International No. 10 cable layer is a trailing type unit for use with tractors having 50 to 85 drawbar horsepower.

Power cable guides on both units are available in two sizes — for 1⅛ inch or 1¾ inch maximum diameter cable. Cable guides on the Nos. 1 and 10 attach to the rear of 1 x 6 inch and 1 x 8 inch heat-

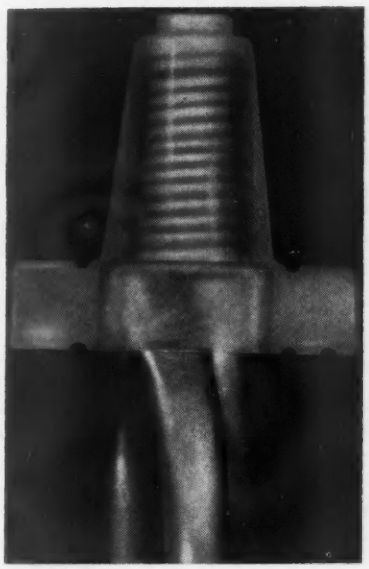
treated standards, respectively.

No. 1 cable layer has a four-inch frame clearance and 20-inch operating depth. No. 10 cable layer has a 10-inch frame clearance and 24-inch operating depth. An adjustment gives proper position to the standard in relation to the desired depth. *Check NP* 241.

Wing-Nut Wire Connector

A NEW wire connector designed to make it easier to join heavy gauge, hard wires used in branch circuit wiring is now being introduced by Ideal Industries, Inc.

Features of the new connector are



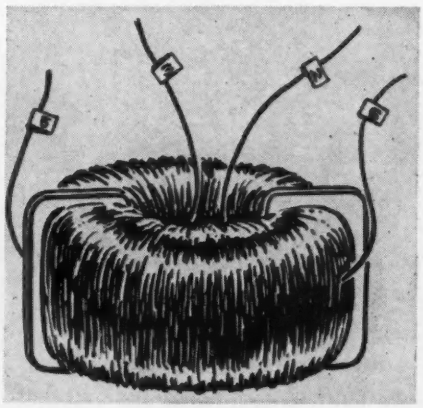
built-in-wrench, spring-tension grip and nylon insulating cap. Wings eliminate use of a wrench and make it easier to screw on hard, heavy gauge wires. The internal tension-spring coils adapt to shape and size of wires and apply pressure so that wires are threaded and crushed together. Nylon insulating cap has high dielectric and impact strength, and is semi-transparent.

Connector is available in two sizes for wire combinations from four No. 16 through two No. 6 with one No. 12. Both connectors are primarily intended for branch circuit wiring, machine hook-ups, etc. and are approved by Underwriters Laboratories, Inc. for pressure cable connections, 600v, 100v in signs or fixtures, branch circuit and fixture wiring up to 105°C. *Check NP* 242.

Micro-Markers Identify

SMALL SELF-STICKING markers for permanent or temporary identification of thin communications wire and tiny electronic components are available from W. H. Brady Co.

Two bold, black, easy-to-read numerical legends are on each 5/16″ x 5/64″ marker. 250 pressure-sensitive Micro-Markers are mounted on a handy Blue Streak ®Dispenser Card. The dispenser card allows one-at-a-time application of markers to wires and components. The marker is "flagged" around the wire lead



with the two ends of the marker stuck together to form a flag. The printed identification can be seen from either side of wire after installation.

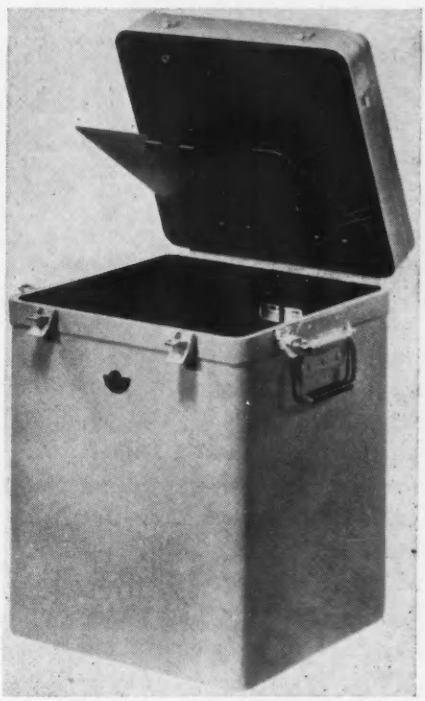
The 5 mil thin Micro-Markers are made from Brady B-330 pressure-sensitive vinyl. The special adhesive anchors the oil- and grease-resistant markers to fabric-covered and plastic-covered wires. Markers withstand a constant operating temperature of 180 degrees F without curling or falling off. *Check NP* 243.

Instrument Cases

A NEW line of extra-deep instrument cases has been announced by TA Mfg. Corp. The new "King-Size" line includes cases up to 30″ high.

The new models come in a diversity of standard lid sizes. During assembly the depth can be varied to meet almost any requirement. Vellums and templates are furnished to instrument manufacturers so they can design their products to conform to these standard sizes.

Models are available with access



doors that allow operators to check instruments without removing them from case. *Check NP* 244.

READER'S SERVICE DEPT.

T - E - M

7 - 1 - 59

■ PLEASE PRINT

NAME: .....

TITLE: .....

COMPANY: .....

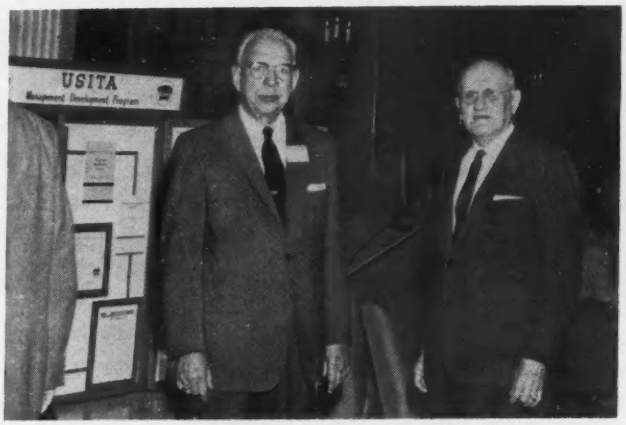
ADDRESS: .....

CITY: .....

Telephone Engineer Publishing Corp.
7720 N. Sheridan Road
Chicago 26, Ill.

■ **Please send me information on the following New Products: — (Check Items Wanted)**

NP 228..... NP 229..... NP 230..... NP 231..... NP 232.....
NP 233..... NP 234..... NP 235..... NP 236..... NP 237..... NP 238.....
NP 239..... NP 240..... NP 241..... NP 242..... NP 243..... 2P 244.....



USITA President HUGH A. BARNHART (left) visits with GEORGE KLOIDY, former Nebraska Association secretary, during 59th annual convention of the Nebraska Independents.

Members of this Nebraska convention group are (l to r): JUDYE DIXSON of the Nebraska Association office staff; NORMAN McFARLIN, assistant REA administrator; and JIM MOORE, v.p., N. W. Bell, Omaha.

industry NEWS briefs

Neil Young Heads Nebraska Tel. Assoc.

REPRESENTATIVES of Independent telephone companies attending the 59th annual convention of the Nebraska Telephone Association at the Hotel Cornhusker, Lincoln, participated in a three-day meeting featuring addresses by: Merle Hale, vice president, Lincoln Tel. & Tel. Co.; W. A. MacDonough, vice president, Kudner Agency, New York City; Jack E. Ewan, regional public relations manager, General Electric Co., Chicago; USITA President Hugh A. Barnhart, Rochester, Ind.; Nebraska Association President C. D. Elwood, Hay Springs; Norman McFarlin, assistant administrator, REA, Washington, D. C.; Commissioner Wayne Swanson of the Nebraska Railway Commission; and J. E. Nelson, secretary, Nebraska Telephone Association.

The following officers were elected for the year: President, Neil N. Young, Cozad Telephone Co., Cozad; Vice President, Jack Dwyer, Hartington Telephone Co., Hartington; and Secretary-Treasurer, J. E. Nelson, Lincoln.

Directors are: LeRoy Jones, Northeast Nebraska Telephone Co., South Sioux City; LeRoy Sieckemeyer, Hunt Properties, Blair; Willard Raile, Benkelman Telephone Co., Benkelman; Walter Hudson, Hamilton County Telephone Co., Aurora; Kenneth Werner, Chambers Independent Telephone Co., Chambers; J. L. Antrim, United Telephone Co. of the West, Scottsbluff; E. J. Lake, Northwestern Bell Telephone Co., Omaha; K. L. Lawson, Lincoln Telephone & Telegraph Co., Lincoln; J. L. Van Horn, General Telephone Co., Grinnell, Iowa, and Clell D. Elwood, Hay Springs Telephone Co., Hay Springs.

Ehinger Reelected Pres., Indiana Tel. Association

APPROXIMATELY 600 members of the telephone industry attended the 39th annual convention of the Indiana Telephone Association at the Claypool Hotel, Indianapolis.

Speakers at the three-day meeting were: USITA Executive Vice President Clyde S. Bailey, Washington, D. C.; R. R. Hirschman, assistant vice president, Indiana Bell Telephone Co.; La Mar S. Stoops, Nappanee Telephone Co.; and Indiana Association President C. D. Ehinger, Decatur, Ind.

Persons attending the convention luncheon heard Robert S. Webb, chairman, Public Service Commission of Indiana, in a brief address. Also appearing with Mr. Webb were the other commissioners and heads of departments of the Public Service Commission. The main luncheon address was delivered by Don A. Tabbert, Indianapolis, U. S. Attorney, Southern District of Indiana, who spoke on the perils of communism.

At the annual banquet several distinguished guests paid special honor and tribute to Hugh A. Barnhart, Rochester, president, United States Independent Telephone Association. The governor's executive assistant, Edwin W. Beaman, presented Mr. Barnhart with the "Sagamore of Wabash Award." R. R. Hirschman, assistant vice president, Indiana Bell Telephone Co., presented Mr. Barnhart with the telephone "Man of the Year Award," a new annual award created by the association's board of directors. Others paying tribute to Mr. Barnhart included Clyde S. Bailey, Washington, D. C., executive vice president, USITA; Mrs. Mayme Workman, ITPA executive secretary, Springfield, Ill.; Clarence Jackson, Indianapolis, president, Indiana State Chamber of Commerce; Henry Schricker, Indianapolis, former governor of Indiana; and R. F. Lucier, Warsaw, vice president in charge of

operations of United Utilities, Inc.

Robert T. Miles, Sunman, general manager of the Sunman Telephone Co., was awarded the 1959 Merit Award for heroism above and beyond the call of duty.

Members of the board of directors re-elected for three-year terms are: R. V. Achatz, Aurora; C. D. Ehinger, Decatur; L. H. Meyer, Fort Wayne; and W. J. Scheidler, Greensburg. George A. Steele, Warsaw, vice president and general manager of United Telephone Co. Inc., was elected to fill the unexpired term of R. F. Lucier. Mr. Lucier resigned because he was recently appointed vice president in charge of operations of United Utilities, Inc. Mr. Lucier was appointed an honorary director of the board in recognition of his long and valuable service to the Indiana Telephone Association.

Association officers re-elected are: C. D. Ehinger, Decatur, president; L. H. Meyer, Fort Wayne, 1st vice president; George A. Steele, Warsaw, 2nd vice president; and George A. Schumacher, Indianapolis, secretary-treasurer.

Berney Simner Heads Missouri Pioneers

THE 14th annual meeting of the Theodore Gary Chapter, Independent Telephone Pioneer Association, was held at the Continental Hotel in Kansas City, Mo., May 25. Two hundred sixty-three members and guests were in attendance. Earl C. Ewer, president of the Chapter, presided at the meeting.

The following officers were elected: President, Berney Simner, St. Louis; Vice President, Harold C. Stouffer, Diamond; and Secretary Treasurer, Miss Katharine A. Bauer, Jefferson City.

Directors are: Earl C. Ewer, Concordia; Gene Box, Columbia; M. S. Bodine, Jefferson City; Jack E. Bartruff, St. James; and C. H. Joy, Columbia.

Advisory Committee members elected to three-year terms are: J. G. Kreamer, Kansas City; C. W. Chastain, Princeton; and C. T. Davis, Sullivan.

Holdover members of the Advisory

BURY IT
FORGET IT

Whitney Blake TELECABLE for Direct Burial, is made to last, to withstand the most "unfriendly" soil conditions and to give long, uninterrupted service underground.

It is quality that makes for true economy . . . that's why we can say "bury it and forget it."

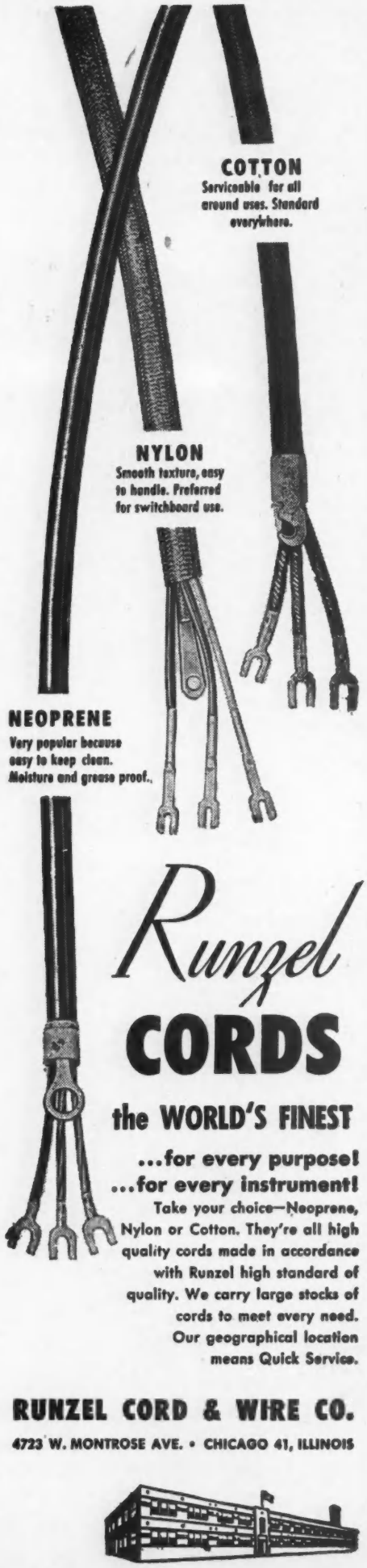
WB TELECABLE — Type DB
Complies with REA
Specifications PE-23

Write for NEW free Bulletin T-5

WB WHITNEY BLAKE CO.

Telephone CHestnut 8-5515
TWX: NH 84

NEW HAVEN 14, CONNECTICUT


COTTON
Serviceable for all around uses. Standard everywhere.
NYLON
Smooth texture, easy to handle. Preferred for switchboard use.
NEOPRENE
Very popular because easy to keep clean. Moisture and grease proof.
Runzel
CORDS
the WORLD'S FINEST
...for every purpose!
...for every instrument!
Take your choice—Neoprene, Nylon or Cotton. They're all high quality cords made in accordance with Runzel high standard of quality. We carry large stocks of cords to meet every need. Our geographical location means Quick Service.
RUNZEL CORD & WIRE CO.
4723 W. MONTROSE AVE. • CHICAGO 41, ILLINOIS

Committee are: Wesley H. Loomis III, Des Plaines, Ill.; R. R. Coffman, Cameron; Fred Fairly, Kansas City; F. B. McHenry, Jefferson City; J. O. Kent, Huntsville; and Eldridge King.

National Sales Executives Honor Donald C. Power

DONALD C. POWER, chairman of the board and chief executive officer of General Telephone & Electronics Corp., New York City, was named "Business Executive of the Year" at the closing session of the 24th Annual International Distribution Congress of National Sales Executives-International at New Orleans.

The organization is composed of more than 30,000 marketing and sales executives throughout the United States and nearly 30 foreign countries. The annual award, which honors an individual "for outstanding business accomplishments" was made by the NSE Executive Committee on the basis of nominations received from officers of chapters throughout the world and from editors of general business magazines. Previous recipients have included Benjamin F. Fairless, Neil McElroy, Clarence Randall, Charles E. Wilson (G. E.), Charles F. Kettering and Paul Hoffman.

In accepting the award, Power cited the steady growth and expansion of consumer demand both in the U. S. and overseas as "an unprecedented challenge to every marketing man in the country." Pointing out that the nation's output of goods and services is currently at the record-breaking annual rate of more than $467 billion, the GT&E chairman predicted that total output will rise to "600 billion in three or four years."

He attributed this growth over the next decade to "a realistic projection of the rate at which our economy has been growing in the past few years, with an extra burst of speed because of the great expansion in research and development."

Warning that his prediction will not be realized unless "all of us get out and make it happen," Power declared: "This is the greatest opportunity of our lives."

"A vital factor in assuring that a $750 billion economy is achieved by 1970 will be a total marketing approach," he said, "combining all aspects of product planning, market research, merchandising, advertising, distribution, and field selling into one major coordinated effort. This 'new look' in selling involves the planned and coordinated job of selling the right goods, in the right quantity, at the right time, to the right customer. This requires just as much sound management as any other phase of the business."

DONALD C. POWER

Clark Named Director Carolina Tel. & Tel. Co.

SAMUEL NASH CLARK, a leading businessman of Tarboro and Edgecombe County, N. C., has been elected a director of Carolina Telephone & Telegraph Co. Clark has been a director of Home Telephone & Telegraph Co. of Virginia since '43.

In addition to carrying on extensive farm operations, Clark is president of W. S. Clark & Sons.

Clark has been active in civic and business affairs of the town, county and state for many years and is one of the founders and at present is chairman of the board of directors of Edgecombe Bank & Trust Co. He has served as a director of the Chamber of Commerce and Merchants Association and now serves as a director of the Edgecombe Homestead & Loan Association. He is a director and past president of the North Carolina Citizens Association.

"Washington Observations"

(Continued from page 22)

phone & Electronics Corp., who outlined the telephone companies' request for common carrier fixed operations in the 840-890 mc band, and for the broadband common carrier mobile system from General Telephone's point of view, declared that development of the mobile service requires ownership of the mobile units by the owner of the automobile.

As far as maintenance of the mobile units is concerned, Mr. Wright said in his appearance at the FCC hearing that this will take more experience, and General will attempt to work out the problem in the light of costs and the need for protection of the telephone service.

Mr. Wright estimated for the Commissioners that General Telephone presently has an investment of between $5,000,000 and $7,000,000 in 890-940 mc equipment. He said it would cost well over $1,000,000 to convert it to 2000 or 6000 mc frequencies, as compared with about $100,000 to move to the 840-890 mc band, as requested.

If there is to be a "second choice" for location of the broadband system, if the FCC is unable to put it in the 450-900 mc area, Mr. Wright said it should be "as close to" 450 mc as possible, rather than above 890 mc.

Answering a question regarding long-term objections to 2000 and 6000 mc frequencies, in addition to immediate cost of conversion, the General Telephone official said that the cost of equipment factor is a long-term as well as a short-term objection. He added that under the "present outlook" he believes that the cost of 2000 and 6000 mc equipment will remain "inordinately high" for the use to which it will be put.

Mr. Wright also said that General System companies are now serving about 3,600,000 landline telephones, and about 550 mobile units. He declared that the relatively small amount of mobile service results both from present quality of the service and cost factors.

J. GERALD BONNAR, assistant director, Communications Industries Div. of BDSA.

J. Gerald Bonnar Becomes BDSA Div. Deputy Director

J. GERALD BONNAR, acting director of development of the North Electric Co., Galion, Ohio, was sworn in Tuesday, June 16, as Assistant Director of the Communications Industries Division of the Busines & Defense Services Administration, US Department of Commerce. Mr. Bonnar has accepted an appointment to serve without compensation for six months while on loan from North Electric.

Most of Mr. Bonnar's business career has been spent with North Electric, with which he has been associated for 23 years. He has served in various positions of a technical nature, including Acting Chief Engineer, Chief Circuit Engineer, and Assistant Director of Development.

At BDSA, he is succeeding Richard B. Bean, of the Automatic Electric Co., who recently concluded a six-month tour as Deputy Director of the Communications Industries Division. Following his BDSA service, Mr. Bonnar will become a member of the National Defense Executive Reserve. — *Roland Davies & Fred Henck. (Mr. Davies and Mr. Henck are the editors of "Telecommunications Reports," Washington, D. C.)*

Now Ready!

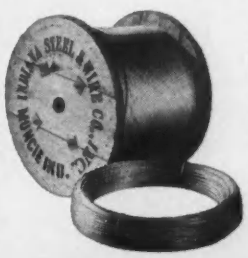
Sag and Tension Data For Strand When Supporting Telephone Cable

WRITE FOR THIS NEW MANUAL!

Those who design, build and maintain aerial telephone cable lines will find the technical information in this manual both pertinent and useful.

The sag and tension data cover three sizes of "Utilities Grade" strand when used as messenger to support plastic-sheath or lead-sheath cable. These data will be helpful in determining the size of strand to be used for a particular weight of cable and span length, and in answering other questions relating to design problems.

This Manual will be mailed without obligation to all interested telephone men. Ask for Manual No. MS-58.



Crapo Galvanized Steel Strand (for both messenger and guys) is available in all standard sizes and grades and in Class A, B and C coatings.

INDIANA
STEEL & WIRE CO., INC.
Muncie, Indiana

10
WE'RE STARTING OUR COUNT-DOWN!
BUT

9-8

Shortly, when the countdown is finished, it will be "blast off" time for another TIF (Telephone Industry First)—the biggest to date!!

This will be news—big news—great news—for every Telephone Company in the U.S.

While we're completing our countdown, we'll not be seen in our usual space in these pages—

BUT WATCH FOR US WHEN THE COUNTDOWN REACHES ZERO!

NORTH ELECTRIC COMPANY

GALION, OHIO

Professional Services

PROFESSIONAL ENGINEERING AND CONSTRUCTION SERVICES

Plant Construction Crews • Installer Repairmen Cable Splicers

CENTRAL OFFICE INSTALLATION

HENKELS & McCOY

PHILADELPHIA

1800 Johnsen St. Elkhart, Ind. Tel. 3-2915

Atlanta, Ga. CE-7-4153 · Ocala, Fla. MA-9-1284
Ashland, Ohio 3-7543 · St. Johns, Mich. 96[illegible]
Bloomington, Ill. 6-1850 · St. James, Minn. 492
Lebanon, Ky. 660 · Wausau, Wis. 2-2356

PERFORMANCE Has Built Our Business

Call us collect for

- CONSTRUCTION CREWS
- CABLE SPLICING
- STATION INSTALLATION
- CENTRAL OFFICE INSTALLATION
- UNDERGROUND DUCT SYSTEM
- CABLE TRENCHING & PLOWING

IRBY CONSTRUCTION CO.
(Since 1925)
815 SOUTH STATE ST.
JACKSON, MISSISSIPPI FL 5-4532

C. D. EHINGER, P. E.
Consulting Engineer
Telephone Utilities
Mail Address:
639 W. Madison
Decatur, Indiana

CARL C. CRANE, INC.
Consulting Engineers
121 S. Pinckney, Madison 1, Wisconsin
Telephone CEDAR 3-4210

McGRATH ENGINEERING, INC.
Consulting Engineers
209 West 6th Street
TOPEKA, KANSAS
Telephone CEntral 2-2358

Installation Specialists
COMMUNI-CATERING
All Makes
P. O. Box 6712
CHICAGO 7, ILLINOIS
CENTRAL OFFICES
Installed-Modified-Removed

FOR ALL OF YOUR CENTRAL OFFICE AND PBX INSTALLATIONS, MODIFICATIONS, AND ENLARGEMENTS, IT'S THE
T. E. I.
Telephone Electronics Installation Corp.
Hayes Bldg., 12 E. Tenth St., Erie, Pa.
MAY WE BE OF SERVICE TO YOU?

INSPECTION SERVICE
"AT TIMBER TREATING PLANTS"
Of poles, crossarms, and preservative treatments. Analysis of wood preservatives
Consultation and specification writing.
A. W. WILLIAMS INSPECTION CO., INC.
MOBILE, ALABAMA
New York St. Louis Portland
Inspectors stationed throughout the U.S.A.

Davis UTILITY PLANT CONSTRUCTION
Construction Co.
45 North Clark Street • Sullivan, Missouri

Whether a Winch Line Hook or a complete Line Body check your requirements with

UTILITY TOOL & BODY CO.
CLINTONVILLE, WISCONSIN
UT&BCo.

HARRIS-McBURNEY CO.
PUBLIC UTILITY CONSTRUCTION
A complete construction service for the telephone industry
Construction Crews Engineering
Station Installers Appraisals & Reports
Cable Splicers C. O. Installation
Underground Duct Systems
Telephone ST 4-6126
P. O. Box 267 Jackson, Michigan

NEALE CONSTRUCTION CO.
ENGINEERING • CONSTRUCTION • MAINTENANCE
TOPEKA, KANSAS PHONE 4-2621

Pressure-treated to specifications. 16 sales offices, 34 plants to serve you. See yellow pages, write Wood Preserving Division, 777 Koppers Bldg., Pgh. 19 or phone Pgh. EXpress 1-3300.

C-40

KOPPERS
POLES • CROSSARMS

ALLEN KANDER AND COMPANY

NEGOTIATORS FOR THE PURCHASE, SALE AND FINANCING OF INDEPENDENT TELEPHONE COMPANIES

WASHINGTON
1625 Eye Street, N.W.
National 8-1990

NEW YORK
60 East 42nd Street
MUrray Hill 7-4242

CHICAGO
35 East Wacker Drive
RAndolph 6-6760

For Central Office Maintenance On
Contract Or Otherwise Installations
With Factory Trained Specialist On All
Types Of Dial Equipment Call Us.

●

Always On The Job To Save You Time & Money

●

All Work Guaranteed
(T E & T Corp.)

Telephone Engineers And Technicians Corporation

OF
AMERICA

Pioneers In Elegant Telephone Servicing

Herreid, S. D., Tel.: HEmlock 7-3303
If No Answer Phone: HEmlock 7-2233
Plain Dealing, Louisiana, Tel.: EAst 6-5251

Reach The Top!

Your card in the "Professional Services" Department of "Telephone Engineer & Management" will bring your services to the attention of the men who specify and order the services, equipment, materials and supplies needed by:

3,890 Telephone Companies
21,439 Central Offices
18,065 Exchanges

"Professional" advertisers almost invariably report prompt and satisfactory results.

BE CONVINCED —
SEND YOUR ADVERTISEMENT
TODAY!

TELEPHONE ENGINEER and MANAGEMENT

7720 N. Sheridan Rd. RO 4-3040 Chicago 26, Ill.

ADVERTISING, DIRECTORIES — *General Telephone Directory Co., 1800 Oakton Street, Des Plaines, Ill.*

BELTS — CLIMBERS — COMPLETE LINEMEN'S EQUIPMENT, *W. M. Bashlin Co., Bashlin Bldg., Grove City 1, Pa.*

BOOTHS — Telephone — Outdoor — Indoor — Steel — Stainless Steel — *Sherron Metallic Corp., 1201 Flushing Ave., Brooklyn 37, N. Y.*

BORING MACHINES, EARTH — *Highway Trailer Co., Edgerton, Wisc.*

CORDS, Switchboard (with or without plugs), **Instrument** (straight and retractile) cords in eleven colors. — *Commercial Cord Co., Inc., 26 Main St., Clifton Springs, N. Y.*

CORDS, Switchboard & Telephone — *Runzel Cord & Wire Co., 4727-31 Montrose Ave., Chicago 41, Ill.*

POLES, Creosote & Creosote Penta-Treated, Southern Yellow Pine — *Piedmont Wood Preserving Co., P.O. Box 700, Augusta, Georgia.*

POLES, Southern Yellow Pine — *Taylor Colquitt Company, 217 E. Main St., Spartanburgh, S. C.*

POLES, Southern Yellow Pine — *Texas Creosoting Co., Orange, Texas.*

PROTECTIVE EQUIPMENT — *Reliable Electric Company, 11333 Addison St., Franklin Park, Ill.*

TELEPHONE EQUIPMENT AND SUPPLIES — *Telephone Repair & Supply Company, 1760 Lunt Avenue, Chicago 26, Ill.*

WIRE, INSULATED — DATED DROP WIRES and all types of telephone wires — *Alphaduct Wire & Cable Company, New Brunswick, N. J.*

WIRE, Insulated Drop and Bronze or Copperweld — *Acorn Insulated Wire Co., Inc., 36 Freeman St., Pawtucket, R. I.*

HELP WANTED

MAINTENANCE MAN — Between ages of 26 and 30 to work for expanding dial telephone company in Fox River Valley area of Wisconsin. At present, company has 460 stations but plans to expand to 600 stations shortly. Permanent job with good benefits for the right man. Send photograph with resume to Box 66, c/o Telephone Engineer & Management.

CABLE SPLICERS. Station Installers, Equipment Installers. Linemen. Experienced men needed. Steady work, good pay. Henkels & McCoy, 1800 Johnson Street, Elkhart, Indiana, or 6100 N. 20th St., Philadelphia, Pa.

SITUATION WANTED

SITUATION WANTED — Young man with eight years plant experience — construction, maintenance, installation, three years as supervisor — wants permanent connection with progressive growing telephone company. Write for resume, Box 69, c/o TEM.

FOR SALE

MAGNETO TELEPHONES — Leich 901 wall or desk magneto telephones. Cleaned, tested and guaranteed, $16.50 each. As removed from service, $15.00 each. Turtle Lake Tel. Co., Turtle Lake, Wisc.

400 LINES of North Electric CX 1000 dial switchboard, 1948 or later. Write Box 71, c/o TE&M.

RECONDITIONED LIKE NEW SETS

A. E. MONOPHONES, #40 SERIES, — St. Line. Hi-Imp, Ringers. Less Dials. @ $10.00 EA. — WITH DIAL. $12.00 ea.
STROMBERG #1243 — DESK SET. ST. LINE. W/DIAL. $12.00 ea.
NORTH ELECTRIC #5H6 — Desk Set. St. Line. Less Dial. $10.00 ea.
STROMBERG #1443 — Desk Sets. W/Dials. St. Line. $15.00 ea.
LEICH MAGNETO DESK SET, #901-1600 Ohm. $21.45 ea.
STROMBERG, #1248 — Desk Set. Magneto. 1600 Ohm. $19.50 ea.
TELKOR-TELERING, Model H Ringing Machine. Reed Type. $5.00 ea.
SUBCYCLE. MODEL. B. $30.00 Small Model H. 7.5 — @$20.00 ea.

INDEPENDENT TELEPHONE REPAIR CO.
2137 West 21st St. Chicago 8, Ill.
LAfayette 3-5439

WANTED TO BUY

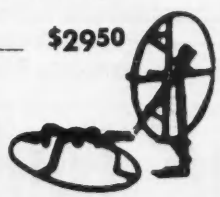
WANTED — Old W. E. magneto switchboards with drop door type combined drops and jacks — #22C or equivalent. Call collect. Bohnsack Equipment Company, Germantown, New York — 213.

HELP WANTED

MANAGER — For exchange 650 Stations Magneto and Common Battery in Northern Iowa. All-around experience required. Man who has managed small mutual company desirable. Give full details. Box 73, c/o T. E.. & M.

LOUD RINGING EXTENSION BELLS
With 6-inch gongs & non-magnetic aluminum cases
Available in straight line & all frequency ringing
SPECIAL RESISTANCE QUOTED ON REQUEST
TELEPHONE REPAIR & SUPPLY CO.
1760 W. Lunt Ave. RO 4-3817-8
Chicago 26, Ill.

Now. Pay out take up wire REELS for Line and Service wire,
For Only $29.50
Whitaker Reel Mfg. Co. Inc.
MONROE, LOUISIANA
Since 1938



DECALS
Made for trucks and equipment
Small or large quantities
Write for free catalog.
MATHEWS COMPANY
827 S. Harvey Oak Park, Ill

FOR LOWEST PRINTING PRICES IN THE TELEPHONE INDUSTRY — CALL SUTTLE. Write for stock form prices today. We specialize in Telephone Printing — All forms, envelopes, bills and Telephone Directories. Or send your own special layout for our low quote. Top quality, fast service. Suttle Printing Division, Suttle Equipment Corporation, Lawrenceville, Illinois. Lawrenceville 782.

CABLE SHEATH STRIPPER

N-2878

• HANDY • FAST • SAFE • EFFICIENT • EASY TO USE

Slits plastic or fabric covered cable. Rigid Phenolic Handle. Stainless steel saddle holds guide and blade in place. Groove guides and supports cable. 2 extra blades.

$7.80 each IMMEDIATE DELIVERY

P. K. NEUSES, INC.
511 N. Dwyer St., Arlington Heights, Ill.

MAGNETO HANDSETS
WALL OR DESK TYPE

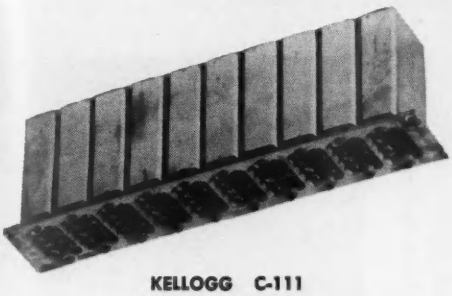
LEICH-901-1600

(RECONDITIONED)
NEOPRENE CORDS
1600 OHM RINGERS

No Changes Necessary To Use As Desk or Wall Telephone

BUCKEYE TELEPHONE & SUPPLY CO.
Dept. T 1250 KINNEAR RD. — HU 8-0655 — COLUMBUS 21, OHIO

PLAN TO CONVERT
Magneto To Dial



KELLOGG C-111

Start now by using CB phones in town — one of these coils connected to each drop, thru condenser to common battery will provide CB service on that line. Subscriber signals operator by lifting handset and rings off by restoring it.

New $1.50 Used—A-1 $1.00

Mounting—10 coil for 19" rack $2.50

Condensers for use with above 2.MF. Stromberg-Carlson 50c

TELEPHONES
(completely reconditioned)

Western Electric #302 with F-I handset, 5-H dial. Ringers; St. Line, Synchromonic 16, 30, 42, 54, 66 cycle. Ready for service—immediate delivery $12.50

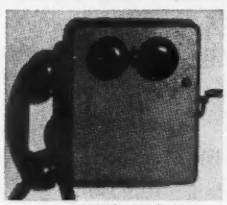
#302, as above, equipped with F-4 handset with T-1 transmitter—U-1 receiver (500 type) $15.00

#302, as above, but blanked for dial (F-1) $10.00

A.E. type 40, St. line, 16, 30, 42, 54, 66 cycle ringers, with #24 or later type dial (fully reconditioned) $12.50

(coiled handset cords, add 50 cents)

Brand New $12.50 each in std. package 8 or 10
Kellogg #5812 MX



5812 MX

5 bar, 1600 ohm, anti-sidetone circuit. Complete with F27 handset coiled cord. Oak cabinet, painted dull green. New and perfect—original factory pack .....$12.50 each

Less than 8 or 10 .....$13.50 each

PIECE PARTS

Kellogg #83-B (48 ohm) capsule type receivers to replace diaphram receivers in F-27, etc., handsets, New	$ 1.00 Each
Receiver Caps P-69426-3 (required for conversion)	.20 Each
Kellogg Transmitters, New	.50 Each
Handsets, W.E. E-1, F-1, F-3, A.E. 41, Kellogg F-27, etc.	
Long Receivers, W.E., A.E., Kellogg, New	1.50 Each
Modern Transmitter fronts with capsule, New	1.50 Each
Kellogg Housing for #925 (P-58724), New..	1.00 Each

All New Material (unless otherwise noted) priced F.O.B. Los Angeles
Shipped on Approval—Satisfaction Guaranteed

TELECTRIC CO.

1218 Venice Blvd. **Richmond 8-2249**
Los Angeles 6, Calif.

ADDING POSITIONS or LINES to your manual exchange?

Kellogg - W.E. - Stromberg-Carlson
(New or good used)

LINE—LAMP JACKS
TRUNK EQUIPMENT
CORD CIRCUITS
REPEATING COILS
SWBD CABLE, braid-plastic-lead

COMPLETE POSITIONS
CB - Universal - Magneto

Kellogg - W.E. - Stromberg-Carlson
also
PBX, cord & cordless

quoted "as removed from service" or "completely reconditioned"

Tell us what you need— let us quote from stock on hand—

Our *Low Prices* on A-1 equipment will *astound* you.

MDF PROTECTION

Western Electric (fully equipped)

#C 50 A, 50 pr. group, new	$40.
reconditioned	25.
C 52 A, 52 pr. new	42.
reconditioned	27.
C 25 A, 25 pr. (½ of C50), new....	20.
1268 A, 20 pr. new	10.
1268 B, 23 pr. new	12.
1269 A, 20 pr., new	10.
1435W(1269-A-wood base), new	10.
1435 U, Fuse group, new	5.
Heat Coils. 76A, new	10¢

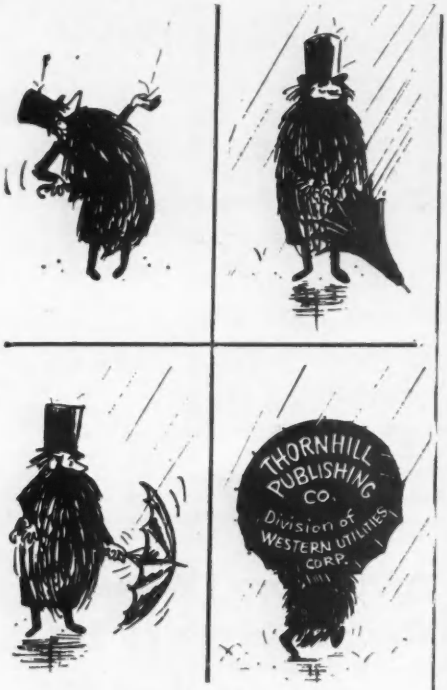
Frames, MDF, W.E. & Cook
6 & 8 ft., single or up to 5 verticals in unit—save over half.

FUSES, 35A, B, C, H, S. New, 10¢. ($9 hund., $80 thousand) 75,000 in stock (standard W.E. pack, 10 or 50)

OPEN WIRE PROTECTION

WE #83A (#84A in wp. mtg. box, 5 pr. block equipped with #26 & #30)
New $5.00—Reconditioned $4.00

Cable Terminals—Most Types



A complete telephone directory publishing service

Offices:

300 Montgomery Street, San Francisco, Calif.
1712 Hewitt Avenue, Everett, Washington
116 So. Rusk Street, Kilgore, Texas
630 Baniff Building, Exchange Park North, Dallas, Texas
121 S.W. First Street, Beaverton, Oregon
130 E. Lime Ave., Monrovia, Calif.

PIONEERS

MONEY MAKERS FOR YOU

WHAT'S NEW EVERYTHING !

12 Styles of Phonettes & Symphonettes—now with Matching Pens and Sockets

4 Designs of Telephone Tumblers.

Array of Jewelry & Gift Items With Choice of Independent or Bell Pioneer Seal or Independent or Bell System Seal.

WRITE FOR CATALOG

WALT BARBER *Advertising Specialties*
BOX 11911 / ATLANTA 5, GA. / CE 3-5478

Wire for all type spinners

ELECTRO-GALVANIZED

GALVANIZED

STAINLESS STEEL

ALUMINUM

COPPERWELD

COPPER

LASHING WIRE

WE PRODUCE

The finest lashing wire possible because we believe . . . that lashing wire is one of the important parts of the cable plant, its duty being to hold the cable to the messenger for the life of the plant.

•

WE COIL

The best coil possible because we know . . . that tangled or out of shape coils can cause spinning trouble, waste and delay.

Write for Complete Information

CABLE SPINNING EQUIPMENT CO.

Topeka Kansas

Price To Head A. E. Sales In Mexico & Cent. America

MILTON M. PRICE, vice president of Automatic Electric International at Northlake, Illinois, has been appointed regional director of sales activities in Mexico and Central America, with headquarters in Mexico City, D. F.; in addition Price will function as vice president and general manager of Automatic Electric de Mexico, S. A.

MILTON M. PRICE

A native of South Dakota, Price studied at the University of Paris and the Ecole Libre des Sciences Politiques in Paris, France and at other schools in France and Germany.

After eight years with the investment banking firm of Blair & Co. of New York, with headquarters in Yugoslavia and in Paris, he joined Automatic Electric in 1930 and in 1935 was appointed managing director of Automatic's then European sales affiliate, Automatic Electric Sales Co. with headquarters in Antwerp, Belgium. In this position he traveled to every country in Europe. He also served, prior to joining Automatic Electric, for three years as a Yugoslav correspondent for A. P.

Transferred to Chicago in 1939, Price spent 1940 — 1944 with the affiliated operating companies in South America and in 1944 was appointed export manager of Automatic Electric International, which position he held until his election in December 1955 as vice president.

Index to Advertisers

Acme Electric Corp. .....
Acme Visible Records, Inc. .....
Acorn Insulated Wire Co. 75
Airtronics International Corp. .....
Alphaduct Wire & Cable Co. 75
Aluminum Co. of America (ALCOA) 2-3
American Chain & Cable Co. (Wright Hoist Div.) .....
American Tel. & Tel. Co. 44-45
Anaconda Wire & Cable Co. 59
Andrew Corp. .....
Anson, Inc., Art. .....
Associated Engineers, Inc. .....
Auburn Machine Works .....
Audio Development Co. 58
Automatic Electric Co. 6-7, 8-9, 28-29

Bashlin Co., W. M. 75
Benner-Nawman, Inc. .....
Berry & Co., L. M. .....
Blaw Knox Co. .....
Bohnsack Equipment Co. 14
Buckeye Telephone & Supply Co. 76
Budelman Electronics Co. 56
Burgess-Manning Co. .....

Cable Spinning Equipment Co. 78
Calculagraph Co. .....
Chance Co., A. B. 46
Charles Machine Works, Inc. 55
Chase Brass & Copper Co. 14
Chisholm-Moore Hoist Division .....
Collins Radio Co. 32
Columbus McKinnon Chain Corp. .....
Commercial Cord Co., Inc. 18, 75
Communi-Catering 74
Communication Equipment & Engrg. Co.
Cook Electric Co. .....
Copperweld Steel Co. .....
Crane, Inc., Carl C. 74

Copperweld Steel Co. .....
Dial Haven, Inc. .....
Diamond Expansion Bolt Co., Inc. .....
Donnelley & Sons, R. R. .....

Ehinger, C. D. 74
Exide, Industrial Division .....

Fanner Mfg. Co. .....
Fitchburg Engrg. Corp. .....

General Cable Corp. 26-27
General Insulated Wire Wks., Inc. .....
General Machine Products Co., Inc. 54
General Telephone Directory Co. .....75, Inside Front Cover
Gladwin Plastics, Inc. 42
Gould National Batteries .....
Graybar Electric Co. .....
Greenlee Tool Co. .....

Hallamore Electronics Co. 15
Harris-McBurney Co. 74
Henkels & McCoy 74
Highway Trailer Co. 75
Holan Corp. .....
Holub Industries, Inc. 14
Hubbard & Co. .....

Independent Telephone Repair Co. 76
Indiana Steel & Wire Co., Inc. 71
Instrument Laboratories .....
International Business Machines (IBM) .....
IRBY Construction Co. 74

Johns Manville Corp. .....

Kander & Co., Allen 74
Kearney Corp. .....
Kellogg Swbd. & Supply Co. 10-11, 52, 54
Kennecott Wire & Cable Corp. 14
Keystone Steel & Wire Co,. Inc. 51
Klein & Sons, Mathias .....
Kleinschmidt Div. of Smith-Corona Marchant, Inc. 4
Koiled Kords, Inc. .....
Koppers Co., Inc. 74

Leich Sales Corp. 12-13
Lindsay Telephone Supply Co. .....
Lorain Products Corp. 1
Loris Sales .....

Mathews Co. 76
McCabe Powers Body Co. ....Inside Back Cover
McGrath Engineering 74
Mine Safety Appliances Co. .....
Minnesota Mining & Mfg. Co. .....
Monsanto Chemical Co. .....
Morrison-Pelsue Co. .....
Motorola, Inc. .....
Murphy Engrg. Laboratories, Inc. 55

Natco Corp. .....
National-Standard Co. .....
National Telephone Supply Co. ....Back Cover
Neale Construction Co. 74
Neuses, Inc., P. K. 76
North Electric Co. 72-73

Orangeburg Mfg. Corp. 24

Page & Hill, Inc. .....
Parsons Co. .....
Pennwood Numechron Co. .....
Phelps Dodge Copper Products Corp. .....
Piedmont Wood Preserving Co. 75
Preformed Line Products Co. .....
Puregas Equipment Corp. .....

Railway Communications, Inc. .....
Raytheon Mfg. Co. .....
Reliable Electic Co. 63, 75
Rex Corp. .....
Reynolds Metals Co. .....
Rohn Mfg. Co. .....
Rolatape, Inc. .....
Runzel Cord & Wire Co., Inc. 20, 70

Schauer Mfg. Corp. .....
Seymour Smith & Son, Inc. .....
Sherron Metallic Corp. 75
Sloan, Cook & Lowe .....
Stahl Metal Products Co. .....
Stewart Brothers .....
Stromberg-Carlson 17, 19, 21, 23, 25, 40-41
Superior Cable Corp. 57
Suttle Equipment Corp. 16, 76

Taylor-Colquitt Co. 75
Telectric Co. .....
Telephone Electronics Installaiton Corp. 74
Telephone Engineer Publishing Corp. 55
Telephone Engrs. & Technicians Corp. of America 75
Telephone Repair & Supply Co. 75, 76
Texas Creosoting Co. 75
Thornhill Publishing Co. 78
Transandean Associates, Inc. .....
Truck Equipment Co. .....
Tudor & Yager .....

U. S. Independent Tel. Association (USITA) .....
U. S. Industrial Chemicals .....
U. S. Instrument Corp. 30
U. S. Motors Corp. .....
U. S. Steel Corp. (American Steel & Wire) .....
Utility Tool & Body Co. 74

Walt Barber Advertising Specialties 78
Western Electric Co. .....
Whittaker Reel Mfg. Co. 76
Whitney Blake Co. 69
Williams Inspection Co., Inc., A. W. 74
Wyoming Valley Equipment Div. .....

THE BACK OF THE BOOK

By JOHN G. REYNOLDS

"An Exciting Job"

THE TELEPHONE man, according to a recent article in *Time* Magazine, must learn to expect anything. To qualify that statement *Time* reported that a lady had asked a repairman to run the new telephone wire through her parakeet's cage so that *"he would have something interesting to perch on."*

Elsewhere: A Chicago woman insisted on having her wall telephone four inches from the floor so she would be forced to exercise while bending to answer it, and a telephone man called to a Chicago hotel to repair a badly frayed cord discovered the cause of the trouble as he was leaving — sitting in the bathtub was a pet lion.

"One Out of Every Four"

LAST month the *Commerce Clearing House*, a national reporting authority on tax and business law, issued a report to *"Mr. Average American: Age* 29." Briefly the report told every 29-year-old worker: *"Taxes are going to grab one dollar of every four you make in the remaining* 36 *years of your working life . . . That's a minimum tax chunk of* $47,221.18 — 25.3% *of your earnings . . . That's about* 62 *cents of your hourly wage in every eight-hour five-day week you work until you retire at* 65."

The Commerce Clearing House described Mr. Average American thusly: 29 with an income of $5,183.71; a wife; a daughter, 2; a son, 5; a low-priced car; and a mortgaged home taxed at $214.17 a year.

This citizen, says the CCH, will pay $5.05 in taxes for every working day — on an average, $25.23 a week and $1,311.70 a year.

And the CCH is somewhat of an optimist — it has assumed that the current tax rate will be in effect all that time and that Mr. X's income also will remain at the status quo.

"The Weapon"

THE EDITOR of *California General News* sees things in a rather unusual — but very accurate — light when he says: The fertile mind of Leonardo da Vinci first conceived a weapon which down through the centuries other men experimented and tinkered with, and finally hammered into a practical working model. In 1895 four of these weapons were used for the first time. No one knew it then, but it was a declaration of war, a war still with us today, gaining in ferocity and futility with each passing year. That weapon is the *automobile.*

The casualties of America's longest and costliest conflict died without a cause. They suffered needlessly. If all of us would realize the full implications of the sombre fact that *the automobile is a weapon* — and drive accordingly — we could commit to memory the worst of all our wars.

"Thief Catcher"

WE WELL know outdoor telephone booths often prove helpful to people in emergencies, but one such booth in Cumminsville, Ohio became a temporary prison for a pair of would-be thieves recently.

Seems two young men tried to batter open the coin compartment of a booth telephone near the home of Kenneth Heller, a Cumminsville resident. Heller heard them banging away with a hammer and screw driver, looked out the window to see what was going on and telephoned police.

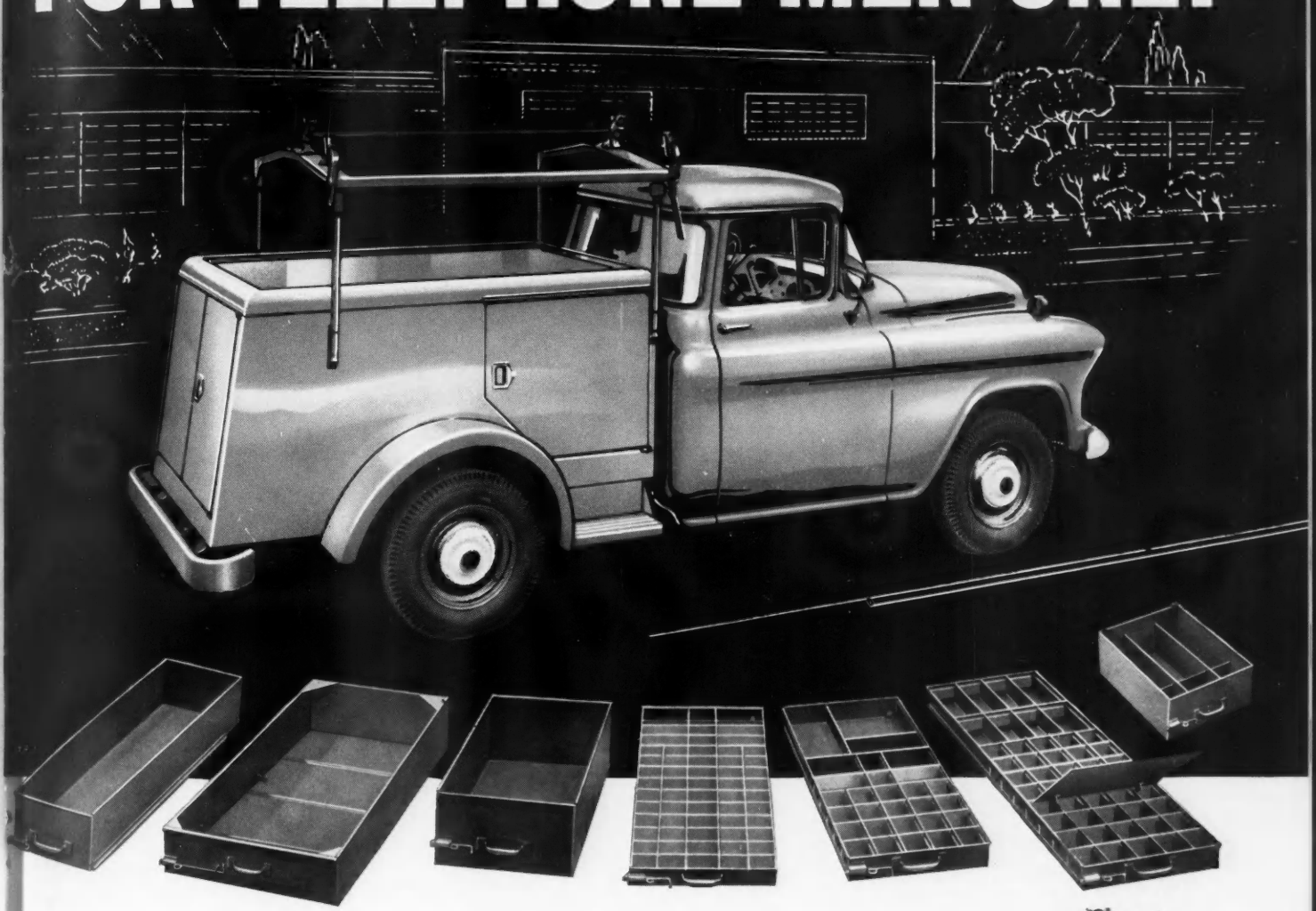
Then he armed himself with a shotgun, went out to the booth and told the busy bandits to drop the tools and stay in the booth till the police arrived. A patrol car arrived shortly to move the two youths from their temporary prison to more spacious quarters in the town jail, where they confessed the attempted robbery.

"What'll they think of next?"

POWERS American

SERIES TI-76 TELEPHONE INSTALLER'S BODY

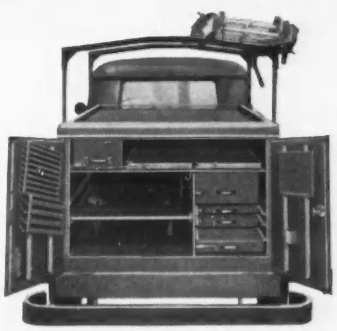
FOR TELEPHONE MEN ONLY



The TI-76 Body is designed for one-trip telephone installation, maintenance, and general service work. It carries everything needed for routine or emergency jobs . . . in weathertight, pilfer-proof compartments that lock with a single key.

In addition to the seven drawers shown above, standard equipment includes shelves, racks, trays, hooks, and brackets for carrying a complete assortment of supplies.

Want details? A copy of descriptive Bulletin No. 121, with price information, is yours for the asking.



Optional equipment includes overhead rack, with brackets for ladders and/or cross arms; extension ladders; wire reel; and spotlight.

SERIES 44-CS carries a completely-equipped workshop for any telephone cable splicing operation.

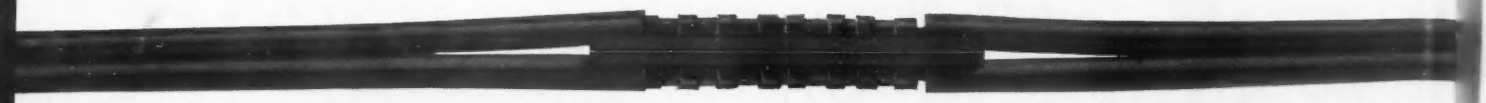
SERIES 25-T has adjustable bins and shelves to carry telephone service tools and materials.

SERIES 33-T equipped to carry tools and supplies for telephone installation and service.

McCABE-POWERS BODY COMPANY

5900 NO. BROADWAY, ST. LOUIS 15, MO.
625 CEDAR STREET, BERKELEY 10, CALIF.
5525 S. E. 28TH AVE., PORTLAND 2, ORE.

Shortest way to Short-proof splices...



Nicopress Splice Separators...

Ideal combination for full-strength, short-proof splices in parallel and twisted-pair wires... Nicopress Sleeves and Nicopress Splice Separators.

Nicopress Splice Separators save time, save tape, eliminate need for staggering splices, provide neater splices, eliminate shorts. Linemen readily make full-strength equal-tension splices in both parallel and twisted-pair conductors with Nicopress Sleeves and Tools, then merely snap the high-dielectric Nicopress Separator between the two splices. Tape is easy to apply over the insulated splices.

Nicopress Splice Separators are available in two sizes... 3456-B for both parallel and twisted-pair drop wire, and 3457-CD for rural distribution wire.

The National Telephone Supply Company

5100 SUPERIOR AVENUE • CLEVELAND 3, OHIO

Canadian Mfr.—N. SLATER CO., LTD., HAMILTON, ONT., CANADA

Export Distributor—INTERNATIONAL STANDARD ELECTRIC CORP., NEW YORK, N. Y.

Nicopress is the Registered Trade Mark of The National Telephone Supply Company